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ILLUSTRATING AND DESCRIBING

Plants of the Royal Botanic Gardens of Kew,

AND OF OTHER BOTANICAL ESTABLISHMENTS;

EDITED BY

D. PRAIN, C.I.E., LL.D., F.R.S.,

DIRECTOR, ROYAL BOTANIC GARDENS, KEW.

VOL. IV.

OF THE FOURTH SERIES.

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> The fields of Enna, now once more ablaze
> With flowers that brighten as thy footstep falls.
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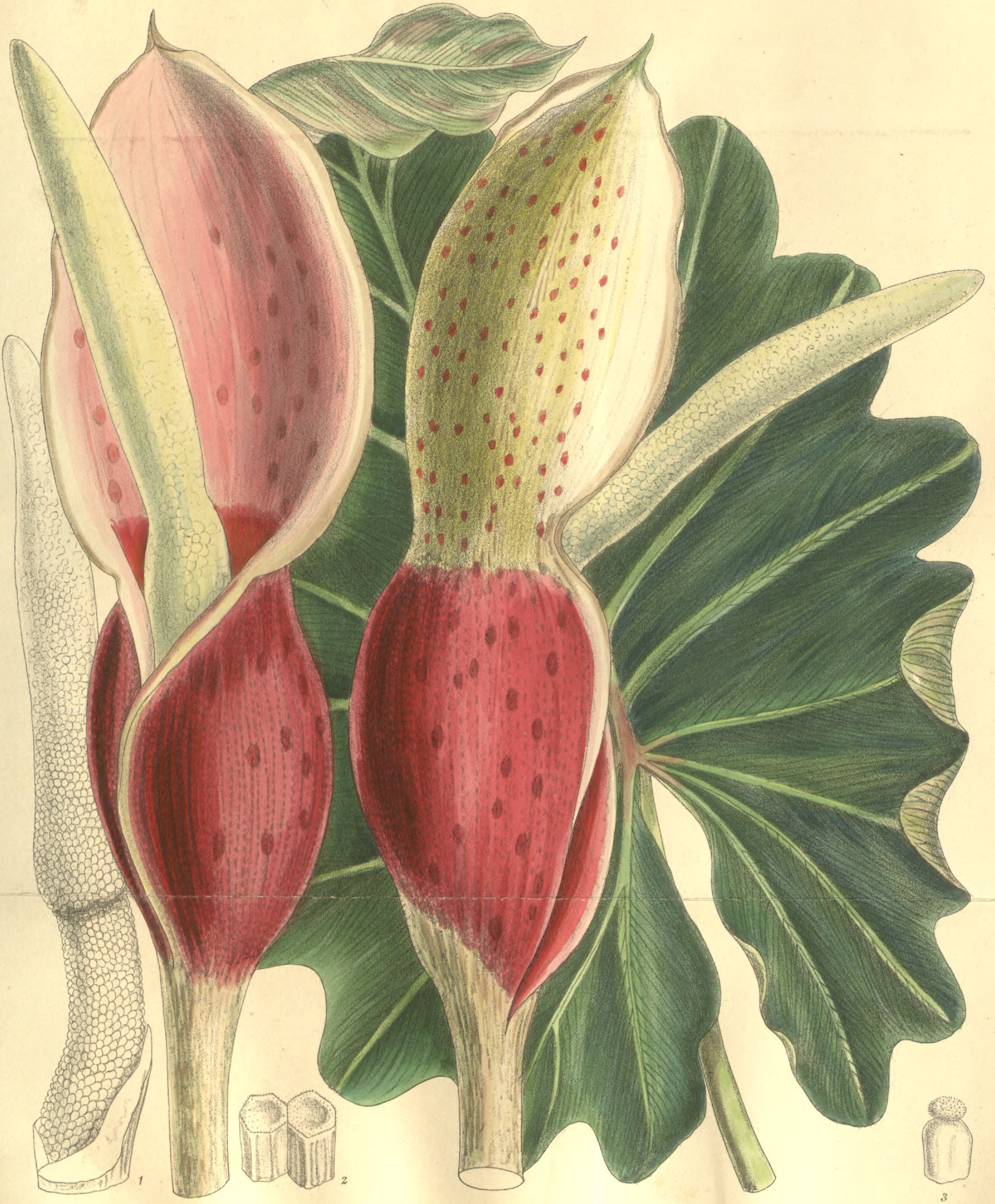

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Tab. 8172.

× PHILODENDRON Corsinianum.

Garden Hybrid.

Araceae. Tribe Philodendreae.

Philodendron, *Schott*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 978; *Engler in DC. Monogr. Phaner.* vol. ii. p. 355.

Philodendron Corsinianum, *Makoy ex Rev. Hort. Belge*, 1887, vol. xiii. p. 140, et 188, vol. xiv. p. 134; hybrida parentibus adhuc ignotis.

Caules scandentes, 2·5–6·5 cm. crassi, superne cataphyllis fibrosis induti. *Folia* sparsa, 2·5–7·5 cm. sejuncta; petiolus 37–68 cm. longus, teres, leviter subrugosus; lamina 37–68 cm. longa, 28–45 cm. lata, alte cordato-ovata, acuta, breviter et obtuse pinnatifido-lobata, lobis basalibus sinu angusto acuto sejunctis, supra viridis, subtus inter venas purpureo-tincta, demum viridis. *Spatha* breviter pedunculata; tubus 7·5 cm. longus, ellipsoideus, extra saturate purpureo-kermesinus, sparse rubiginoso-maculatus, punctisque numerosis albidis notatus, intra laete kermesinus; lamina 10–11·5 cm. longa, cymbiformis, subulato-apiculata, extra viridis rubro-maculata, intra kermesina rubro-maculata, marginibus albida. *Spadix* 15–16 cm. longus, 1·2–1·6 cm. crassus, albidus.

This ornamental stove Aroid is a hybrid raised by the firm of Messrs. Makoy of Liege, for which they were awarded a Certificate of Merit by the Royal Agricultural and Botanical Society of Ghent in 1887. Its parentage is not mentioned, but judging from the purple tint on the under surface of its leaves, a coloration which is unusual in the genus, it is possible that *P. verrucosum*, Mathieu, may have been one of its parents. When young the leaves are deeply tinged with coppery brown, but as they become older this colour almost disappears, as in the leaf figured. For a climbing species it appears to be of comparatively slow growth, since the plant at Kew, from which our figure was made in May last, was acquired in 1898, and is now only about 8 feet high, with a spread of about 6 feet.

Description.—*Stem* climbing, rooting, 1–2½ in. thick, clothed with brown fibrous scale-leaves on the upper part. *Leaves* spreading, 1–3 in. apart; petiole 1¼–2¼ feet long, in the larger leaves about ½ in. thick at the middle, terete, with a slightly rough surface, green; blade 1¼–2¼ feet long, 11–18 in. broad, deeply cordate-ovate, acute, shortly pinnatifidly lobed, with the roundish basal lobes separated by a narrow acute sinus 4½–7 cm. deep, bright deep green above, dull purple between the green veins beneath, changing to green with age; midrib flat above, very prominent beneath; primary veins about 7 on each side of the midrib, with the 2 basal ones close together, the others distant; impressed above, prominent beneath; basal lobes with 5–6 primary veins, all united into one at the base, where it is shortly denuded at the sinus. *Inflorescence* solitary in each axil. *Peduncle* short, green, with whitish lines. *Spathe* with an ellipsoid tube 3 in. long, of a rich purple-crimson, with scattered spots of crimson-brown and numerous rows of minute white dots outside, and bright deep carmine inside; limb 4–4½ in. long, 2⅓–2¾ in. broad, boat-shaped, with a short convolute point, light green, spotted with red outside and carmine, with darker spots inside, shading into white at the margins. *Spadix* 6–6½ in. long, ½–⅔ in. thick, terete, acute, slightly curved forwards, creamy-white.—N. E. BROWN.

CULTIVATION.—While in the genus *Anthurium* hybrids of garden origin are numerous and in the genus *Richardia* there are several, the plant now figured is the only hybrid *Philodendron* that has been raised artificially. This plant, which was purchased for Kew as an ornamental foliage plant, has been grown under moist tropical conditions in the Aroid (No. I.) House, where it has climbed up the stem of a tree-fern to the height of about 8 feet, and it was not until it developed flowers at Kew that the decided attractiveness of its inflorescence, both as regards size and colour, were revealed. Most of the Philodendrons have large, handsome and fragrant flowers, and are excellent plants for clothing pillars, palm-stems and back-walls in tropical houses, purposes for which they are largely employed at Kew both in the Palm House and in the Aroid House, near the main entrance.—W. WATSON.

Fig. 1, spadix, with the spathe removed; 2, two stamens; 3, ovary:—*Leaf reduced*; *fig.* 1, *natural size;* 2 and 3, *enlarged.*

8173

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TAB. 8173.

PAEONIA MLOKOSEWITSCHII.

Caucasus.

RANUNCULACEAE. Tribe PAEONIEAE.
PAEONIA, *Linn.; Benth. et Hook. f. Gen. Plant.* vol. i. p. 10.

Paeonia Mlokosewitschii, *Lomakin in Trud. Tifl. Bot. Sad.* (*Act. Hort. Bot. Tifl.*) ii. (1897), p. 282; affinis *P. Wittmannianae*, Stev., foliolis supra glaucescentibus subtus glaucis breviter pubescentibus, floribus apertis, carpellis albo-tomentosis distincta.

Herba perennis, caule glabro. *Folia* biternata; foliola late oblonga vel subelliptica, lateralia obliqua, apice brevissime acutata vel acuminata, basi obtusa, 8–10 cm. longa, 4–6 cm. lata, supra glaberrima glaucescentia, subtus glauca et breviter pubescentia, margine nervisque rubris; petiolus et petioluli glabri. *Flores* aperti, circiter 12 cm. diametro, pedicello glabro rubescente 10 cm. longo. *Sepala* inaequalia, alterum oblongo-lanceolatum, acutum, supra basin constrictum, alterum suborbiculare, basi breviter contractum, obtusissimum, utrumque glabrum. *Petala* circiter 8, rotundata, concava, flava. *Stamina* numerosissima; filamenta antheris subduplo longiora. *Carpella* 3, oblonga, albo-tomentosa; stigmata subsessilia, purpurea.

This is one of a group of yellow-flowered Paeonies from the Caucasus, the others being *P. Wittmanniana*, Stev., which was figured on Tab. 6645, and *P. macrophylla*, Lomakin. All three are very closely allied, and their discrimination in the dry state is difficult, if not, indeed, sometimes impossible. Alboff in his Prodromus Florae Colchicae (in Act. Hort. Bot. Tifl. vol. i. p. 14) went even so far as to treat *P. Wittmanniana* and *P. macrophylla* as forms of *P. corallina*, Retz., and he would no doubt have dealt with *P. Mlokosewitschii* in the same way. As, however, no experiments have been made to test the constancy of the characters which have been relied upon in discriminating between those forms, and as they appear readily distinguishable when seen in the living state it is certainly more expedient to treat them at present as distinct species. *P. Mlokosewitschii* was discovered by Mlokosewitsch near Lagodekhi in the eastern part of the Central Caucasus, whilst typical *P. Wittmanniana* is a native of Adsharia in the basin of the Tshorok River, south of Batum. Lomakin (in Act. Hort. Bot. Tifl. vol. ii. p. 283) described, however,

a variety of *P. Wittmanniana* from the Talysh with carpels tomentose as in *P. Mlokosewitschii.* The distinctive characters of *P. Wittmanniana* and *P. Mlokosewitschii* are thus reduced to differences in the colour and pubescence of the leaves and possibly in the extent to which the petals open out; at the same time the area of the former is extended right across the Caucasian region from the Black Sea to the Caspian. The specimen figured was communicated by Mr. Gumbleton of Belgrove, Queenstown, Ireland, where it flowered in May. Mr. Gumbleton obtained the plant from Mr. Max Leichtlin of Baden-Baden. Since then young plants have been raised at Kew from seeds received from the Tiflis Botanic Garden.

DESCRIPTION.—*Herbaceous,* perennial; with stout glabrous stems. *Leaves* biternate; leaflets broad-oblong or subelliptic, the lateral oblique, tips very shortly pointed or acuminate, base obtuse, 3–4 inches long, 1½–2½ inches broad, glabrous and dark blueish-green above, shortly pubescent and pale glaucous below, margins and nerves red; petioles and petiololules glabrous. *Flowers* open, about 4–5 inches in diameter; pedicels glabrous, reddish, 4 inches long. *Sepals* unequal, one oblong-lanceolate, constricted above the base, the other suborbicular, very obtuse, both glabrous. *Petals* about 8, roundish, concave, yellow. *Stamens* very numerous; filaments twice as long as the anthers. *Carpels* 3, oblong, whitish-tomentose; stigmas subsessile, purple.—O. STAPF.

CULTIVATION.—This, the most handsome of the yellow-flowered Paeonies, thrives under the treatment suitable for the other forms belonging to the herbaceous section of the genus, and appears as hardy and as satisfactory under cultivation as they have proved. The glaucous leaves with their red veins and margins contrast sufficiently with the more purely green leaves of *P. Wittmanniana* (B. M. t. 6645) to attract attention, and it is certain to become a favourite with gardeners. The fine sulphur-yellow flowers are more striking than the whitish-yellow blooms of *P. Wittmanniana,* though the latter are as a rule larger and more decidedly yellow than was the case in the plant figured at t. 6645.—W. WATSON.

Figs. 1 and 2, sepals; 3, stamen; 4, gynoecium:—*all slightly enlarged.*

8174

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Tab. 8174.

VIBURNUM utile.

China.

Caprifoliaceae. Tribe Sambuceae.

Viburnum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 3.

Viburnum (§ Tinus) **utile,** *Hemsl. in Journ. Linn. Soc.* vol. xxiii. p. 356; species inter affines foliis crassis supra glabris subtus dense tomentosis facile distinguitur.

Frutex 1–1·5 m. altus, ramulis floriferis elongatis rectis primum stellato-pubescentibus cito glabrescentibus. *Folia* persistentia, breviter petiolata, crassa, coriacea, lanceolato-oblonga vel interdum ovato-oblonga, saepius 2·5–8 cm. longa, rarius usque ad 15 cm. longa, obtusa, integerrima, supra glabra, nitida, subtus pilis stellatis multiradiatis incano-tomentosa, venis primariis paucis supra impressis subtus elevatis. *Flores* omnes conformes, circiter 1 cm. diametro, dense cymosi; cymae compositae, umbellatae, terminales, densae, hemisphaericae, 5–8 cm. diametro, breviter pedunculatae; pedicelli ovario breviores, pubescentes. *Calyx* glaber, nitens, dentibus ovatis obtusis circiter 1 mm. longis. *Corolla* rotato-campanulata, vix 1 cm. diametro, lobis rotundatis. *Stamina* breviter exserta. *Ovarium* 1-loculare, 1-ovulatum, ovulo ab loculi apice pendulo; stylus brevis, crassus, carnosus, pilis stellatis paucis ornatus, stigmate capitato. *Fructus* fere siccus, oblongus, compressus, circiter 8 mm. longus, laevis, glaber.

Specimens of this species were first recorded by Hance (Journ. Bot. 1882, p. 6) as *V. cotinifolium*, Don, var. *γ*, Hook. f. & Thoms.; but Hooker and Thomson, so far as our investigations go, never published such a combination; nor do we find herbarium specimens thus designated. *V. cotinifolium*, Don, is indeed a very different species, closely resembling the native *V. Lantana*, Linn. It is figured in the Botanical Register, 1834, t. 1650.

The present drawing of *V. utile* was made from materials supplied by Messrs. James Veitch & Sons, who raised it from seed sent home by their collector, Mr. E. H. Wilson; but it was first discovered near Ichang by Mr. T. Watters, of the British Consular Service, in 1880. Kew now possesses dried specimens from numerous localities in Hupeh and Szechuen. *V. utile* var. *suaveolens*, Franch. mss., from Yunnan, collected by Delavay and Henry, is regarded by Mr. A. Rehder as a distinct species; but the differences are not evident, and he has not yet published a description.

January, 1908.

Upwards of fifty species of *Viburnum* have now been recorded from China and the area of the genus encircles the northern hemisphere in temperate regions, and extends into the southern hemisphere in Madagascar as well as the Andes, where there are species so like some of the Chinese ones as to be easily mistaken for these in a dried state.

DESCRIPTION.—*Shrubby*, 4–5 ft. high, with long, straight flowering-branches, at first clothed with a stellate pubescence, later glabrescent. *Leaves* persistent, shortly stalked, thick, leathery, lanceolate-oblong or ovate-oblong, usually 1–3 in. long, sometimes 6 in. long, obtuse, quite entire, smooth and shining on the upper surface, lower surface densely clothed with a white indumentum composed of multiradiate, stellate hairs; primary veins few, impressed above, elevated below. *Flowers* all similar, $\frac{1}{3}$–$\frac{1}{2}$ in. across, densely cymose; cymes compound, umbellate, terminal, 2–3 in. across, shortly stalked; pedicels shorter than the ovaries, pubescent. *Calyx* smooth; teeth small, obtuse, about $\frac{1}{25}$ in. long. *Corolla* rotate-campanulate; lobes broad, rounded. *Stamens* a little longer than the corolla. *Ovary* 1-celled, 1-ovuled. *Fruit* dry, oblong, flattened, smooth, black, about $\frac{1}{4}$ in. long. —W. B. HEMSLEY.

CULTIVATION.—As seen growing in the Coombe Wood Nursery last spring, this shrub gave the impression that it would eventually prove one of the most desirable of recent introductions from China. The habit was neat and bushy, and the flowers very freely borne. Like the other species of the genus, it can, no doubt, be increased easily by cuttings, and like them, too, it will thrive in ordinary well-cultivated ground, especially where the soil can be kept from getting excessively dry during the summer months. Mr. Wilson records the species as growing on limestone.—W. J. BEAN.

Fig. 1, portion of a young branch; 2, a stellate hair from the same; 3, a partially expanded flower; 4, a corolla laid open showing the attachment of the stamens; 5, calyx and pistil:—*all enlarged.*

8175

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Tab. 8175.

HERBERTIA AMATORUM.

South America.

IRIDACEAE. Tribe MORAEEAE.

HERBERTIA, *Sweet, Brit. Flow. Gard.* series 1, 1827, t. 222, et ed. 2, 1838; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 691, *sub* Alophia.

Herbertia amatorum, *C. H. Wright in Kew. Bull.* 1907, p. 321; a speciebus *H. amoena*, Griseb., et *H. coerulea*, Herb., ungue macula obcordata notato nec punctato differt.

Cormus globosus, tunicis brunneis vestitus. *Folia* linearia, ad basin attenuata, 18–20 cm. longa, 5–8 mm. lata. *Scapus* cylindricus, glaber, 1–2 mm. diam. 30–50 cm. altus; rami tenues, circiter 14 cm. longi. *Spathae* herbaceae, ad apices brunneae, virides; exterior 25–32 mm. longa, interior 42–48 mm. longa. *Perianthium* 5 cm. diam.; tubus glaber, viridis; segmenta exteriora obcuneata, obtusa, atroviolacea; unguis macula alba obcordata notatus; interiora lanceolata, acutiora, violacea, basi brunneo-maculata. *Antherae* luteo-virides. *Stylus* carnosus; rami filiformes, acuti, 2 mm. longi.

The genus *Herbertia* is confined to Southern and Central America, and includes, so far as is known, some fourteen species whereof, in addition to that now figured, the only ones hitherto met with in cultivation appear to be *H. coerulea*, *H. Drummondiana* and *H. pulchella* (B.M. t. 3862). Some authors have preferred to employ for this genus the name *Alophia*, given by Herbert in this work at t. 3779, regarding *Herbertia* as a synonym. According to Dalla-Torre and Harms the date of publication of *Alophia* was 1838; as a matter of fact this name was not published till Feb. 1840, whereas in the reissue of Sweet's British Flower Garden, which is dated 1838, there is a figure of *H. pulchella*, while the plate itself bears the signature:—Pub. by R. Sweet, Oct. 1827.

For seeds of the species now figured Kew is indebted to Dr. C. B. Cantera, of the Natural History Museum, Montevideo, who collected and forwarded them in 1903. Corms raised from these seeds flowered here for the first time in a greenhouse in May, 1907.

JANUARY, 1908.

Description.—*Corm* globose, brown. *Leaves* linear, attenuate towards the base, 7–8 in. long, $\frac{1}{8}$–$\frac{3}{8}$ in. broad. *Scape* cylindrical, glabrous, about $\frac{1}{16}$ in diameter, 12–20 in. high; branches slender, about 5 in. long. *Spathe* herbaceous, green with brown tip; outer 1–$1\frac{1}{4}$ in. long, inner about 2 in. long. *Perianth* 2 in. diam.; tube glabrous, green; outer segments obcuneate, obtuse, dark violet; claw marked with a white obcordate spot; inner segments lanceolate, acute, violet with a brown spot at the base. *Anthers* yellowish green. *Style* fleshy; stigma branches filiform, acute, $\frac{1}{16}$ in. long.—T. F. Chipp.

Cultivation.—*Herbertia amatorum* is the most handsome species of this genus so far brought into cultivation. The beautiful dark porcelain-blue flowers are very fugitive, but the plants bloom continuously for several months. The Herbertias call for the same treatment as *Rigidella* and *Ferraria*, to which they are nearly allied; they require protection from frost, a light sandy soil, and a sunny position in a frame or greenhouse. It is possible that in the warmer parts of the United Kingdom this and some of the other species could be grown in a sheltered sunny border in the open air.—W. Watson.

Fig. 1, base of outer perianth-segment; 2, base of inner perianth-segment; 3, stamens and style-arms; 4 and 5, anthers; 6, whole plant:—1–5, *enlarged*; 6, *about one-fifth nat. size.*

8176

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TAB. 8176.

PSEUDOLARIX FORTUNEI.

China.

CONIFERAE. *Tribe* ABIETINEAE.

PSEUDOLARIX, *Gord.*; *Benth et Hook. f. Gen. Plant.* vol. iii. p. 442, in nota sub Larice.

Pseudolarix Fortunei, *Mayr, Monogr. Abiet. Jap.* 1890, p. 99; *Mast. in Journ. Linn. Soc.* 1902, vol. xxvi. p. 557, et 1906, vol. xxxvii. p. 424; *E. H. Wils. in Gard. Chron.* 1907, vol. xlii. p. 344; species unica.

Arbor interdum usque ad 35–40 m. alta, aspectu *Laricis europaeae*, sed ramis magis divaricatis, monoecia. *Folia* acicularia, decidua, ima basi articulata, 2–8 cm., sed saepius 3–4 cm. longa, 1·5–2 mm. lata, glabra, tenuia, flexilia, vix acuta, subtus obscure 2-sulcata, costa supra leviter elevata, canalibus resiniferis 2 intramarginalibus et 1 (vel interdum 2?) mediano instructa, in ramis lateralibus valde abbreviatis 30–40 vel pauciora, intra perulas parvas obtusas scariosas totidem biseriatim quasi-verticillata, confertissima, recta, stellatim radiata, in ramis primariis dissite spiralia, basi semi-torta, internodiis brevibus; cataphylla intra folia numerosa, lineari-acuminata. *Amenta mascula* oblongo-cylindrica, in ramulorum lateralium brevissimorum aphyllorum apicibus numerosa (plerumque 25–30), fasciculata, graciliter stipitata, recurva, cum stipite aequilongo circiter 1 cm. longa; fasciculi bracteis tenuibus scariosis obovatis stipites fere aequantibus involucrati; ramuli floriferi nunc cum ramulis omnino similibus foliiferis intermixti, nunc separati. *Antherae* in quoque amento circiter 20, biloculares, transversim bivalvatim dehiscentes, connectivo non producto vel sursum in appendicem filiformem apice integram vel dentatam extenso. *Amenta feminea* globosa, 1·5–2 cm. diametro, ad ramulorum lateralium apices terminalia, foliis paucis plane spiralibus fulta. *Ovula* 2, prope squamae basin affixa, reversa. *Strobilus* ovoideo-oblongus, 4–5 cm. longus, erectus. *Bracteae* ovato-lanceolatae, 5–8 mm. longae, integrae vel obscure denticulatae, squamis basi adnatae et demum cum iis deciduae. *Squamae seminiferae* ovatae, 2–3 cm. longae, 1·3–1·5 cm. latae, obtusae vel bifidae, leviter undulatae, coriaceae, basi lignescentes, breviter stipitatae, laxae, divergentes, cum seminibus maturis adnatis deciduae. *Semina* sub quaque squama 2, samaroidea, alata, squamam aequantia. *Embryo* clavatus, in albuminis centro rectus, circiter 4 mm. longus, infra cotyledones leviter constrictus; cotyledones 4, circiter 1 mm. longae, arcte conniventes.—*Abies Kaempferi*, Lindl. Gard. Chron. 1854, pp. 255 et 455, cum figura coni, quoad plantam Fortuneanam tantum et excl. synon. Kaempf. et Lamb., non Lindl. in Penny Cyclop. 1833, vol. i. p. 34; Fortune, A Residence among the Chinese, 1857, p. 274, cum figura habitus, et in Gard. Chron. 1860, p. 170; Murray, The Pines and Firs of Japan, 1863, pp. 97–108. *Larix Kaempferi*, Carr. in Flore des Serres, 1856, vol. xi. p. 97; Miq. Prol. Fl. Jap. 1867, p. 389; Franch. et Savat. Enum. Pl. Jap. 1875, vol. i. p. 466, excl. synon. Kaempf. et Lamb.; Franch. Pl. David. i. p. 286. *Larix amabilis*, Senilis [E. Nelson], Pinaceae, 1866, p. 84. *Pseudolarix Kaempferi*, Gord. Pinetum, 1858, p. 292, excl. synon. Lamb.; Eichler in Engl. & Prantl Natürl. Pflanzenf. 1889, vol. ii. 1, p. 77, f. 33; Mast. in Gard. Chron. 1884, vol. xxi. pp. 581 et 584, ff. 112 et 113; Journ. Linn. Soc. 1886, vol. xxii. p. 208, tt. 9 et 10. *Laricopsis Kaempferi*, Kent in Veitch's Man. Conif. new ed. 1900, p. 403, ff. 105 et 106.

JANUARY, 1908.

More than forty years ago Andrew Murray pointed out that this Chinese tree, introduced by Fortune, was not, as at first supposed, the Japanese "Larix conifera, nucleis pyramidatis, foliis deciduis" of Kaempfer (Amoen. Exot. p. 833); therefore *Pinus Kaempferi*, Lamb. (Genus Pinus, ed. 3, 1832, p. 7) and the original *Abies Kaempferi*, Lindl. (Penny Cyclop. 1833, vol. i. p. 34) are not synonyms of *Pseudolarix Fortunei*. Moreover, these names were applied to the Japanese tree twenty years before the *Pseudolarix* was discovered. Lindley's identification has caused much confusion in the synonymy of this species, but although Murray cleared it up, he did not introduce a new name. Kaempfer's tree is *Larix leptolepis*, Gord., yet Franchet & Savatier, following others, cite it under *Larix Kaempferi*, Carr. (*Pseudolarix Fortunei*, Mayr), which is not a native of Japan, and was not, up to a few years ago, even cultivated in that country. It is true that Franchet & Savatier record it, on the authority of Miquel, as being in cultivation in Japan, adding that it was also very probably wild; but Mayr states positively that it was not in cultivation there up to 1890. Mayr has taken the step rendered necessary by Murray's elucidation of the facts, and the late Dr. M. T. Masters has accepted Mayr's name in the most recent revision of the Chinese Coniferae (Journ. Linn. Soc. Nov. 1, 1906, vol. xxxvii. p. 424), as he had previously done in the place cited above. But as long ago as 1847 Endlicher (Synopsis Coniferae, p. 130) cited Kaempfer's *Larix conifera* under his *Pinus leptolepis*, syn. *Abies leptolepis*, Sieb. & Zucc., having apparently overlooked the publication of *Pinus Kaempferi*, Lamb.

Fortune discovered this tree in the mountains of Chekiang, and sent seeds to England in the winter of 1853. He had formed a high opinion of its value as an ornamental tree, and took infinite trouble to ensure its introduction. Writing in 1860 he says: "I used every means in my power to introduce its seeds in large quantities and in good condition. They were sent by the overland mail, some in letters and some in small packages, for several years in succession, and were often sown in England in less than two months from the time they were gathered from the tree in China. Out of all sent home only one despatch vegetated freely; all the others were complete failures. All the plants of any size now in England were dug up in the woods of China and sent home in Wardian cases. In cultivation this species, like many of its race, prefers a loamy soil and a hilly or undulating situation. I would advise the possessors of very small plants to keep them in shady places during the hot summer months. In nature the young plants are all reared under the shade of trees."

Pseudolarix Fortunei is apparently a rare tree in its native country. Fortune found it only in the Province of Chekiang; Franchet records it, with doubt, from Kiangsi, and Wilson states that it occurs wild on the Lushan, Kiangsi, where, however, he found only a few small trees. In this country it is still uncommon; the finest specimen we have seen is in the gardens at Penjerrick, near Falmouth. Although perfectly hardy, it cannot be said to flourish at Kew, where there are several trees. One of these, near the clump of *Celtis australis* and *Quercus Ilex*, to the left on entering the gardens from Kew Green, flowered profusely in June, 1907, when the drawing was made. Fully developed cones followed in abundance on the uppermost branches, containing apparently fully developed seeds, even to the albumen, but no embryo was formed. The only perfect seeds we have seen are some of Fortune's collecting, preserved in spirit at Kew, from one of which was obtained the previously undescribed embryo.

Description.—A tree with the habit and appearance of a larch, sometimes as much as 120–130 ft. high; branches somewhat stratified, as in the Cedar of Lebanon. *Leaves* deciduous, needle-shaped, usually 1–1½ in. long, sometimes as much as 3 in. long on vigorous shoots, thin, flexible, not prickle-pointed, whorled and stellately spreading in the lateral spurs, spirally arranged in the primary branches. *Male catkins* clustered at the tips of lateral spurs without any leaves below, recurved, including the slender stalk about ⅓ in. long. *Anthers* about 20 in each catkin. *Female catkins* globose, about ¾ in. in diameter, borne at the tips of lateral spurs, with a few spirally arranged leaves below. *Cone* ovoid-oblong, 1¾–2 in. long. *Scales* 2-seeded, ovate, ¾–1¼ in. long, obtuse or notched at the tip, leathery, woody at the base, shortly stalked, loose, spreading, falling with the seeds. *Seeds* winged, equalling the scales, and, as the scales open, the wings project beyond them, giving them the appearance of having a white margin. *Embryo* straight, club-shaped, about $\frac{1}{6}$ in. long; cotyledons 4, about one-third as long as the radicle.—W. B. HEMSLEY.

CULTIVATION.—As a garden tree the Golden Larch is perhaps the most beautiful of the *Larix* group. It is easily distinguished from the true Larches, even in the absence of cones, by the larger size and greater substance of the leaves. At all times attractive, it is especially so in spring, when the young foliage is a beautiful shade of tender, yellowish green, and again in autumn, when the leaves turn a rich golden colour before falling. It thrives best in a good well-drained loamy soil. At Kew the natural soil of the gardens is too poor for this tree to succeed well. It is only by mixing with it a large proportion of stiff loam that *Pseudolarix Kaempferi* can be made to develop its characteristic beauty.—W. J. BEAN.

Fig. 1, a branch bearing male flowers; 2, a male catkin; 3 and 4, anthers; 5, a branch bearing female flowers; 6, a scale and its subtending bract; 7, a scale seen from the inside bearing two scales; 8, a cone; 9, a seed:—*figs.* 1, 5, *and* 8, *natural size, the others enlarged.*

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CONTENTS OF No. 37, JANUARY, 1908.

TAB. 8172.—× PHILODENDRON CORSINIANUM.
" 8173.—PAEONIA MLOKOSEWITSCHII.
" 8174.—VIBURNUM UTILE.
" 8175.—HERBERTIA AMATORUM.
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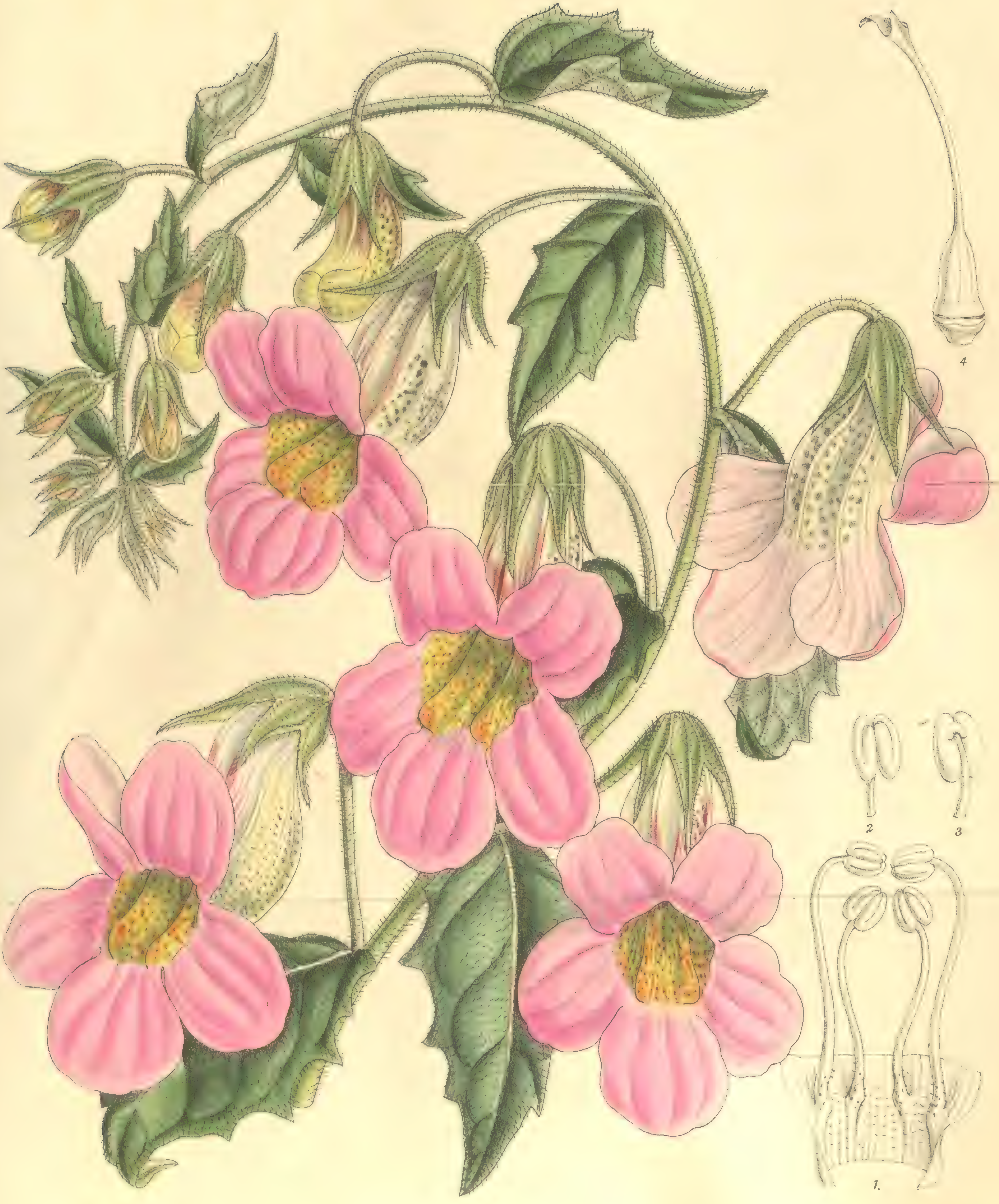

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TAB. 8177.

REHMANNIA ANGULATA.

China.

SCROPHULARIACEAE. Tribe DIGITALIEAE.

REHMANNIA, *Libosch*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 960.

Rehmannia angulata, *Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 193; *Gard. Chron.* 1903, vol. xxxiii. p. 290, cum fig. p. 296; species *R. glutinosae*, Libosch, majus affinis, ab ea tamen differt partibus omnibus majoribus, foliis grosse dentato-lobatis et floribus roseo-purpureis.

Herba biennis vel perennis, glanduloso-hirsuta, statura valde variabilis, exemplaria sylvestria 15 cm. ad 1 m. alta, culta caulibus interdum usque ad 2 m. longis. *Caules* teretes, subsimplices. *Folia* alterna, tenuia, papyracea, ovato-oblonga, petiolata, inferiora usque ad 15 cm. longa, sursum gradatim minora, suprema parva, bracteiformia, sessilia, inferiora irregulariter duplicato-dentato-lobata, superiora paucidentata, dentibus acutissimis, omnia glabrescentia. *Flores* rosei, fauce luteo-tincti et rubro-maculati, axillares, solitarii, pedunculati, nutantes, 9–10 cm. longi, pedunculis longiores. *Calyx* glanduloso-hirsutus, campanulatus, circiter 3 cm. longus, alte 5-lobatus, lobis acuminatis acutis inaequalibus, postico longiore. *Corolla* declinata; tubus latus, ventricosus, curvatus, intus basin versus puberulus et fauce pilis paucis longis instructus; limbus bilabiatus, 6–7 cm. diametro, lobis rotundatis divergentibus. *Stamina* didynamia, inclusa, fere basilaria; filamenta filiformia, 1·5–2 cm. longa; antherae per paria approximatae, loculis divergentibus. *Ovarium* glabrum, imperfecte 2-loculare, loculis multiovulatis; stylus filiformis, inclusus, stigmate inaequaliter bilabiato. *Capsula* non visa.—*R. glutinosa*, Libosch, var. *angulata*, D. Oliv. in Hook. Ic. Pl. t. 1589.

This is another of the numerous ornamental Chinese plants introduced by Messrs. James Veitch & Sons, through Mr. E. H. Wilson. It is an exceedingly free-growing subject, and seedlings exhibit a considerable amount of variation in colour. Dried specimens of it were at first associated, as a variety, with the original *R. chinensis*, Fisch. & Mey. (B. M. 1838, t. 3653), which is the same as *R. glutinosa*, Libosch; but fully developed cultivated plants present a very different appearance. Unfortunately it is not so hardy as the older one, which inhabits the northern province of Chihli in the neighbourhood of Peking, whereas *R. angulata* is a native of the central provinces of Hupeh and Kweichau. There are several other species of this genus, which is confined to the Chinese region. *R. rupestris*, Hemsl. (B. M. 1891, t. 7191) is very different, and should perhaps be separated generically.

FEBRUARY, 1908.

Description.—*Biennial* or perennial, clothed with glandular hairs. *Stems* in cultivation 4–6 ft. long. *Leaves* alternate, stalked, ovate-oblong, lower 6 in. long, gradually smaller upwards, uppermost bract-like and sessile, irregularly lobed and toothed or only toothed; teeth very acute. *Flowers* pink, tinged with yellow and beset with darker spots in the throat, axillary, solitary, distinctly stalked, nodding; stalks shorter than the flowers. *Calyx* campanulate, about 1 in. long, deeply 5-lobed; lobes narrow, pointed, uppermost longer than the others. *Corolla* 3–4 in. long; tube broad, ventricose, curved; limb 2-lipped, $2\frac{1}{2}$–$2\frac{3}{4}$ in. across, lobes rounded, spreading. *Stamens* 4, didynamous, much shorter than the corolla; filaments slender; anthers connivent in pairs with divergent cells. *Ovary* glabrous; style included. *Capsule* not seen.—W. Botting Hemsley.

Cultivation.—This handsome herbaceous plant is probably a perennial, but under cultivation it is most satisfactory when treated as a biennial. The seeds are sown in a little warmth in May, and the young plants are grown in a frame till the following May, when they are planted in an open border, where by July they are from 4 feet to 6 feet high and in full flower. Or they may be grown in pots and treated as greenhouse plants. In the warmer parts of the country this plant has proved hardy. It ripens seeds freely at Kew.—W. Watson.

Fig. 1, portion of base of corolla-tube and stamens; 2 and 3, front and back view of anther; 4, pistil:—*all enlarged.*

8178

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TAB. 8178.

CODONOPSIS CONVOLVULACEA.

Eastern Asia.

CAMPANULACEAE. Tribe CAMPANULEAE.

CODONOPSIS, *Wall.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 557.

Codonopsis convolvulacea, *Kurz in Journ. Bot.* 1873, vol. xi. p. 195; *Hook. Ic. Plant.* t. 2385; *Hemsl. in Journ. Linn. Soc.* vol. xxxvi. p. 468; species calyce manifeste supero, corolla lobis ad basin usque sejunctis insignis.

Herba perennis. *Caules* volubiles, graciles, glabri, laxe ramosi. *Folia* membranacea, saepius sparsa, ovata vel ovato-lanceolata, 2–5 cm. longa, 0·5–3 cm. lata, apice subacuta vel acuta vel acuminata, basi cuneata vel truncata vel interdum cordata, margine subintegra vel minute denticulata, utrinque saepissime glabra; petioli gracillimi, 0·25–1·25 cm. longi. *Pedunculi* glabri, elongati, volubiles. *Calyx* superus, 5-sectus, tubo obconico glabro 0·75 cm. longo, lobis triangulis lanceolatisve saepius acutis 0·5–1 cm. longis 0·25–0·5 cm. latis glabris vel raro parce ciliatis. *Corolla* campanulata, 5-partita, 2–4 cm. longa, limbo 3–5 cm. lato, coerulea, lobis triangulis vel oblanceolatis acutis et saepe minutissime mucronulatis. *Filamenta* glabra, radiatim refracta, extra prope basin appendicibus ovatis margine ciliatis induta; antherae oblongae, glabrae, introrse dehiscentes. *Stigma* 3-lobum. *Capsula* truncata vel subconica, 3-valvis, 0·5–0·75 cm. longa.

The species of *Codonopsis*, of which twenty-two are now known, have been critically examined by Mr. T. F. Chipp, who considers that they admit of arrangement in four sections distinguished by the relative position of the floral whorls. In one section, limited to the single species *C. Tangshen*, figured at t. 8090 of this work, the calyx is inferior. In another, represented by *C. rotundifolia*, figured in two varieties at t. 4942 and t. 5018, but including ten other species, the calyx is half-superior while the corolla is superior. In a third section, including seven species, none of which have yet been figured in this work, the calyx and corolla are both half-superior. In the last section, which includes only three species, the calyx is superior. It is to this section that *C. convolvulacea*, the plant now figured, belongs; within the section our plant stands alone in having the corolla-lobes free to the base.

FEBRUARY, 1908.

Like the other species, *C. convolvulacea* is confined to Eastern Asia, but its area of distribution within the region is somewhat wide, for it extends from the Shan Plateau in Central Indo-China northwards into Yunnan and Szechuan and thence westward into Central Tibet; the flowers in Tibetan examples are smaller than in the Chinese and Shan specimens, but do not materially differ in other respects.

Extensive as the area from which specimens have been reported actually is, it seems possible that it may prove to be wider than these indicate. The plant from which our figure was prepared was presented to Kew by Mr. M. Leichtlin of Baden-Baden in 1906 and flowered here in August, 1907. Its flowers were larger than those of Burmese specimens and than those of all the Chinese specimens except in a single gathering communicated by Mr. A. Hosie from between Batang and Tachienlu, and thus differed as much from these, in a converse direction, as the flowers of Tibetan specimens do. But, like the Tibetan ones, they agree with the Chinese and Burmese flowers in every character save that of size.

When Mr. Leichtlin sent this plant to Kew he suggested that it might be a Campanulaceous species new to cultivation, but added no note as to its origin. With a plant sent by him at the same time to Mr. H. J. Elwes, in whose collection at Colesborne it flowered contemporaneously with the plant at Kew, Mr. Leichtlin gave a locality in the North-West Himalaya. In response to a request for more definite information, Mr. Leichtlin has most obligingly stated that these plants were derived from seeds communicated to him by the late Mr. W. Gollan, Superintendent of the Botanic Garden at Saharanpur in Northern India; these seeds were obtained in the North-West Himalaya by one of Mr. Gollan's native collectors. Hitherto no Indian botanist has communicated herbarium specimens of *C. convolvulacea* from any portion of the Himalaya, but, when regard is had to the care which characterises the work of Mr. Leichtlin and characterised that of Mr. Gollan, the possibility that *C. convolvulacea* may occur in the North-West Himalaya should not be overlooked by botanical travellers.

Description.—A perennial herb. *Stems* slender, smooth, twining, sparingly branched. *Leaves* membranous, usually quite glabrous, mostly alternate, ovate-lanceolate or ovate, $\frac{3}{4}$–2 in. long, $\frac{1}{5}$–1$\frac{1}{4}$ in. wide, subacute or acute or acuminate, with cuneate or truncate or sometimes cordate base, the margin subentire or faintly toothed; petioles slender, $\frac{1}{8}$–$\frac{1}{2}$ in. long. *Peduncles* smooth, long, twining. *Calyx* superior, the tube obconic, smooth, $\frac{1}{4}$–$\frac{1}{3}$ in. long, the limb 5-lobed, lobes triangular or lanceolate, usually acute, $\frac{1}{5}$–$\frac{2}{5}$ in. long, $\frac{1}{8}$–$\frac{1}{5}$ in. wide, usually glabrous, sometimes sparingly ciliate. *Corolla* campanulate, blue, 5-partite to the base; lobes $\frac{3}{4}$–1$\frac{1}{2}$ in. long, triangular or oblanceolate, acute and often finely mucronulate; limb 1$\frac{1}{4}$–2 in. across. *Filaments* glabrous, spreading, each with an ovate ciliate appendage at the base on the outer side; anthers oblong, glabrous, their dehiscence introrse. *Stigma* 3-lobed. *Capsule* truncate or subconic, 3-valved, $\frac{1}{4}$–$\frac{1}{3}$ in. long.

CULTIVATION.—Though the individual flowers are striking, *C. convolvulacea* cannot be reckoned a showy plant; the Kew plant had indeed only one flower open at one time. It does not, however, compare unfavourably with the other species that have been in cultivation, most of which, as stated by Dr. Lindley, are plants with dull-coloured flowers recalling those of an *Atropa*, with the habit of a miniature *Canarina*. From its behaviour Mr. Leichtlin is inclined to think that the present species may be a biennial. It has been grown at Kew as a pot-plant, in a cold frame.—D. PRAIN.

Fig. 1, a flower from which the corolla and part of the calyx have been removed; 2 and 3, stamens with appendage:—*all enlarged.*

8179

M. S. del. J. N. Fitch lith. Vincent Brooks, Day & Son Lᵗᵈ imp.

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TAB. 8179.

PYRUS TSCHONOSKII.

Japan.

ROSACEAE. Tribe POMEAE.

PYRUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 626.

Pyrus Tschonoskii, *Maxim. Mél. Biol.* pars ix. p. 165; *Bull. Acad. Pétersb.* 1874, vol. xix. p. 169; *Sargent, For. Fl. Japan*, p. 40, t. 14; *P. yunnanensi*, Franch., affinis, sed inflorescentiis paucifloris, foliis fructibusque majoribus et calyce persistente distincta.

Arbor 10–12 m. alta, trunco 30 cm. diametro, cortice laevi pallido, coma angusta rotundata; ramuli teretes, crassiusculi, primo laxe incano-tomentosi, deinde nigrescentes, lenticellis sparsis punctiformibus. *Gemmae* hibernantes ovoideae, obtusae, 5 mm. longae, perulis latis castaneis vel aurantiaco-rubescentibus dense ciliatis. *Folia* late ovata, acuta vel acute acuminata, basi rotundata, irregulariter dentata dentibus glandulosis, 5–12 cm. longa, 3·5–7 cm. lata, firma, supra primo floccoso-villosa, demum glabrata, viridia, infra albo-tomentosa matura subglabrata, pallida, nervis lateralibus utrinque 6–10 rectis valde obliquis; petioli graciles, 2–3 cm. longi. *Racemi* umbelliformes 4–6-flori, incano-villosuli; pedicelli 1–1·5 cm. longi. *Receptaculum* campanulato-obconicum, incano-villosulum, 5 mm. longum. *Calycis dentes* ovati, acuti, 3 mm. longi, dorso incano, facie copiose albo-villosi, sub anthesi patentes, deinde erecti cum fructu persistentes. *Petala* alba, apicem versus roseo-suffusa, circiter 12 mm. longa. *Stamina* circiter 40. *Styli* 5, basi coaliti, infra medium albo-villosi. *Fructus* globosus vel globoso-obovoideus, ad 2·5 cm. diametro, viridi-flavescens, uno latere rubescens, lenticellis pallidis verruculosus, sapore austero, carne granulis duris permeata.—*Eriolobus Tschonoskii*, Rehder in Sargent, Trees and Shrubs, vol. i. p. 73, t. 37.

This is apparently a rare tree in Japan, so far only found in woods in Central Hondo. It was named after Tschonoski, one of Maximowicz's collectors, who discovered it at Sibasiri at the foot of Fujiyama; subsequently in 1892 it was collected near Nikko and at the foot of Asamayamo north of Tokio by Professor Sargent, who introduced the tree into the Arnold Arboretum and, in 1897, presented plants to Kew. It belongs to the section *Eriolobus* which was originally proposed as a genus by Roemer and reconstituted as such by Rehder, l.c., who includes in it four species, all Asiatic.

DESCRIPTION.—A tree, 30–40 ft. high, trunk 1 ft. in diam.; bark smooth, pale; young branchlets whitish-

FEBRUARY, 1908.

tomentose, at length glabrous and dark with small lenticels; winter-buds ovoid, obtuse, brown to bright orange, ciliate. *Leaves* broad, ovate, acute or acuminate, rounded at the base, irregularly dentate, from 2 to over 4 in. long, 1½–3 in. wide, firm, floccose-tomentose above when young, ultimately glabrous, whitish-tomentose beneath, lateral nerves straight, very oblique, 6–10 on each side; petioles slender, about 1 in. long. *Racemes* umbel-like, 4–6-flowered; pedicels about ½ in. long, whitish-villous. *Receptacle* ⅕ in. long, whitish-villous. *Calyx-teeth* ovate, acute, spreading in flower, erect and persistent in fruit. *Fruit* more or less globose, about 1 in. in diameter, greenish-yellow and more or less red on one side with small lenticels; flesh austere, gritty.—OTTO STAPF.

CULTIVATION.—The most striking character of this rare and interesting tree is its erect, open, and rather formal habit. It has been grown at Kew quite unprotected for ten years, and may therefore be considered hardy. Like the other members of the same genus it enjoys generous treatment. It has grown well at Kew in a border of rich loam. It flowered in the spring of 1907 better than it had done previously, this being partly due to increasing age and partly, no doubt, to the splendid ripening weather of the previous autumn.—W. J. BEAN.

Fig. 1, part of young leaf (upper surface); 2, section of calyx with pistil 3 and 4, anthers; 5, part of the peel of the fruit with lenticels:—*all enlarged.*

8180

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TAB. 8180.

POTENTILLA CONCOLOR.

China.

ROSACEAE. Tribe POTENTILLEAE.

POTENTILLA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 620; *Ch. Lehm. Revis. Potentill.* p. 1.

Potentilla concolor, *Rolfe*; a *P. Griffithii*, Hook. f., foliolis duplo majoribus concoloribus, floribus duplo majoribus differt.

Herba perennis, circa 3 cm. alta. *Caules* suberecti, validi, pubescentes. *Folia* radicalia non vidi; caulina petiolata vel superiora subsessilia, pinnata vel superiora trifoliolata; rhachis pubescens; foliola obovato-elliptica, inciso-dentata, basi attenuata, 2–5 cm. longa, concoloria, pubescentia; stipulae ovato-oblongae, obtusae vel subacutae, integrae, tenuiter pubescentes, 1–3 cm. longae. *Cymae* laxae, pauciflorae. *Flores* speciosi, 4 cm. lati, lutei. *Calyx* 2·5 cm. latus, 5-bracteolatus; lobi ovato-oblongi, acuti, tenuiter pubescentes. *Bracteolae* calycis lobis similes. *Petala* latissime obcordata, apice biloba, 1·5–2 cm. lata. *Antherae* purpureo-marginatae. *Achaenia* et styli glabri.—*Potentilla Griffithii*, var. *concolor*, Franch. Pl. Delav. p. 213.

The handsome *Potentilla* here figured is a native of the province of Yunnan, in south-western China, where it was discovered by the Abbé Delavay about twenty years ago, growing in calcareous soil on Mt. Yen-tze-hay, at about 10,500 ft. elevation. It was described as a variety of the Himalayan *Potentilla Griffithii*, Hook. f., by Franchet, who, however, pointed out that it has much larger concolorous leaflets, not white-tomentose beneath as in the typical form; also larger foliaceous stipules and much larger golden yellow flowers. It has now appeared in cultivation, having been submitted for determination in May last by Messrs. Bees, Ness, Neston, Cheshire, with the information that it had been received from Yunnan. Now that living specimens are available it is evident that the plant referred to cannot be *P. Griffithii*, Hook. f.; though a member of the same group, it is quite unlike the Himalayan plant in general aspect, and is clearly a distinct species, for which the varietal name, *concolor*, may be retained as the specific appellation. *P. Griffithii* has leaflets of about half the size of the present species, and these are invariably densely white-tomentose beneath, and the tomentose character also

FEBRUARY, 1908.

extends to the sepals and bracteoles, while the flowers generally are not half as large. *P. concolor* is probably the finest yellow-flowered species known, and promises to be a very showy garden plant. It will probably prove as hardy as its Himalayan congeners.

DESCRIPTION.—A perennial herb over a foot high. *Branches* suberect, stoutish, pubescent. *Radical leaves* not seen; *cauline leaves* petiolate or the upper subsessile, pinnate or the upper trifoliolate; rachis pubescent; leaflets obovate-elliptical, deeply toothed, attenuate at the base, 1–2 in. long, concolorous, pubescent; stipules ovate-oblong, obtuse or subacute, entire, slightly pubescent, ½–1 in. long. *Cymes* lax, few-flowered. *Flowers* very large, over 1½ in. across. *Calyx* spreading, 1 in. broad, with five bracteoles alternating with the sepals and similar to them in shape; lobes ovate-oblong, acute, slightly pubescent. *Petals* broadly obcordate, bilobed at the apex, ½–¾ in. broad, deep yellow, with an orange-coloured blotch at the base. *Anthers* elliptic-oblong, margined with purple. *Achenes* and style glabrous.—R. A. ROLFE.

CULTIVATION.—Only a few of the numerous species of *Potentilla* have won recognition as garden plants, and the best of these is *P. Russelliana* (B. M. t. 3470) which is a hybrid, said to have been raised at least 75 years ago by a Mr. Russell of Battersea, from *P. atrosanguinea* and *P. nepalensis*. The plant here figured is, in habit and general characters, very similar to *P. Russelliana*; but whilst the latter has rich blood-red flowers, those of the present plant are bright yellow. These are produced in May, and the plant is evidently quite hardy, thriving under the treatment that answers for the garden representatives of *Geum* and *Geranium*.—W. WATSON.

Fig. 1, calyx and bracteoles; 2 and 3, anthers; 4, a young carpel:—*all enlarged.*

8181

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TAB. 8181.

LARIX GRIFFITHII.

Sikkim and Bhutan.

CONIFERAE. Tribe ABIETINEAE.

LARIX, *Mill.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 442; *Eichl. in Engl. et Prantl, Natürl. Pflanzenfam.* vol. ii. i. p. 75.

Larix Griffithii, *Hook. f. in Him. Journ.* vol. ii. p. 44 (nomen) et fig. p. 55; *Ill. Himal. Pl.* t. 21 (excl. fig. 1–4); *Gammie, in Rep. Bot. Surv. Ind.* vol. i. no. 2, p. 11; *Gamble, Man. Ind. Timb.* ed. 2, p. 720; a *L. decidua*, Mill., differt conis multo majoribus cylindricis, carpellis oblongis subulato-caudatis a medio reflexis squamas ovuligeras duplo superantibus.

Arbor 6–20 m. alta, trunco gracili, coma pyramidali, ramis longis subdeflexis, ramulis longissimis flexilibus pendulis, primo pilosis citissime glabratis viridi-alutaceis vel pallide brunneis demum nigrescentibus, pulvinis parvis truncatis decurrentibus verrucosis. *Gemmae* hibernantes globoso-ovoideae, perulis intimis hyalinis latis unguiculatis floccoso-villosis. *Folia* decidua in brachycladiis cylindricis 5–8 mm. longis 4–6 mm. latis 30–50 patentia, acicularia, acutiuscula, 25–35 mm. longa, 0·5 mm. lata, complanata, utrinque leviter 2-sulcata, viridia, superne glauca. *Strobili masculi* ovoidei, lutei, rubescentes, circiter 8 mm. longi, pedicellati, basi squamis hyalinis unguiculatis floccoso-villosis suffulti; connectivi appendix parva, ovata. *Strobili feminei* breviter cylindrici, atro-purpurei, ad 3 cm. longi, vix 1·5 cm. diametro, basi uti masculi squamis hyalinis suffulti. *Carpella* lanceolata, ob costam excurrentem subulato-caudata, a medio reflexa, margine superne repanda. *Squamae* ovuliferae latissime rotundatae quam carpella duplo breviores. *Coni* maturi in ramulis pendulis erecti, cylindrici, ad 7 cm. longi, 3 cm. lati, purpureo-brunnei, squamae late truncato- vel subemarginato-obovatae, ad 1 cm. longae et ultra 1 cm. latae. *Semen* obovoideum, vix 3 mm. longum, ala oblique elliptica duplo longiore.—*Larix sp.* Griffith, It. Not. p. 189; Priv. Journ. p. 287. *L. Griffithiana*, Gord. Pinet. p. 126. *Abies Griffithiana*, J. Hook. et Lindl. ex Gord. in Journ. Hort. Soc. vol. v. p. 214 (nomen). *Pinus Griffithii*, Parl. in DC. Prodr. vol. xvi. pars ii. p. 411.

This Larch was discovered in 1838 by Griffith in Bhutan on the mountain slopes above Woollakoo, a village somewhat south-west of Punakha, between 6000 and 9600 feet. In 1848 it was found by Sir Joseph Hooker on the slopes of Nango Mountain in Eastern Nepal, and in the following year in the Lachen Valley in Sikkim. More recently it has also been recorded from the Chumbi Valley at 10,000 feet. Its western limit lies, according to Nepalese sources, near the headwaters of the Kosi River. In Sikkim it appears, according to Mr. Gammie, at 8000 feet, becomes

FEBRUARY, 1908.

plentiful at 9500 feet and ascends to 12,000 feet. Griffith describes it as a small tree, and so Sir Joseph saw it in Nepal; but in Sikkim it is as much as 65 ft. high. In its natural habitat it prefers dry, rocky soil and grassy slopes, and is, like our larch, a light-loving tree. It is known in Sikkim as 'Sah' or 'Saar,' and is cut up in planks which Sir Joseph describes as soft and small but very durable. The drawing was made from specimens in cultivation at Kew, with the exception of the male catkins which were figured from a specimen supplied by Sir Edmund Loder of Leonardslee, Horsham, Sussex.

DESCRIPTION.—*Tree* 20–65 ft. high, with slender trunk, long branches and very long, cordlike, pendulous branchlets, pilose when quite young, pale at first, then dark, rough from the small persistent leaf-cushions. *Winter buds* globose-ovoid, inner scales hyaline, very broad, clawed, floccose-villous. *Leaves* needle-shaped, those on the cylindric short-shoots fascicled, 30–50, and spreading, subacute, about 1 in. long, $\frac{1}{25}$ in. wide, flat, bisulcate on both sides, bright green, with glaucous lines above. *Male flowers* ovoid, yellowish, tinged with red, about $\frac{1}{3}$ in. long, shortly pedicelled; appendage of connective small, ovate. *Female flowers* cylindric, dark-purple, over 1 in. long. *Carpels* (bracts of the older authors) lanceolate, subulate-caudate, reflexed from the middle; ovuliferous scales very broad, rotundate, half as long as the carpels. *Cone* cylindric, up to almost 3 in. long, over 1 in. in diameter, purplish-brown; scales broad, truncate or subemarginate-obovate, up to $\frac{1}{2}$ in. long and broad. *Seed* obovoid, scarcely $\frac{1}{8}$ in. long; wing broad, obliquely elliptic, $\frac{1}{4}$ in. long.—OTTO STAPF.

CULTIVATION.—None of the other Larches and very few Conifers have proved so difficult to cultivate in Great Britain as this Himalayan species. Seeds have been imported to Kew on several occasions, and as a rule they have germinated freely. But the young plants rarely live more than a few years. The average climate of Great Britain is doubtless unsuited for it, and the resulting ill-health renders it peculiarly subject to the attacks of the Larch-blight (*Chermes abietis*). During the last twenty years it has not lived to attain a greater height at Kew in the open than 3 ft. Apart from its susceptibility to insect attack it ought to thrive in the gardens of the milder parts of England and in many parts of Ireland. The tree at Leonardslee is, indeed, apparently quite healthy. Yet it still remains the fact that this Larch is one of the rarest of cultivated Conifers, although numerous young plants have been distributed from Kew.—W. J. Bean.

Fig. 1, anther; 2, back view of carpel and ovuliferous scale; 3, front view of the same:—*all enlarged.*

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CONTENTS OF No. 38, FEBRUARY, 1908.

TAB. 8177.—REHMANNIA ANGULATA.
„ 8178.—CODONOPSIS CONVOLVULACEA.
„ 8179.—PYRUS TSCHONOSKII.
„ 8180.—POTENTILLA CONCOLOR.
„ 8181.—LARIX GRIFFITHII.

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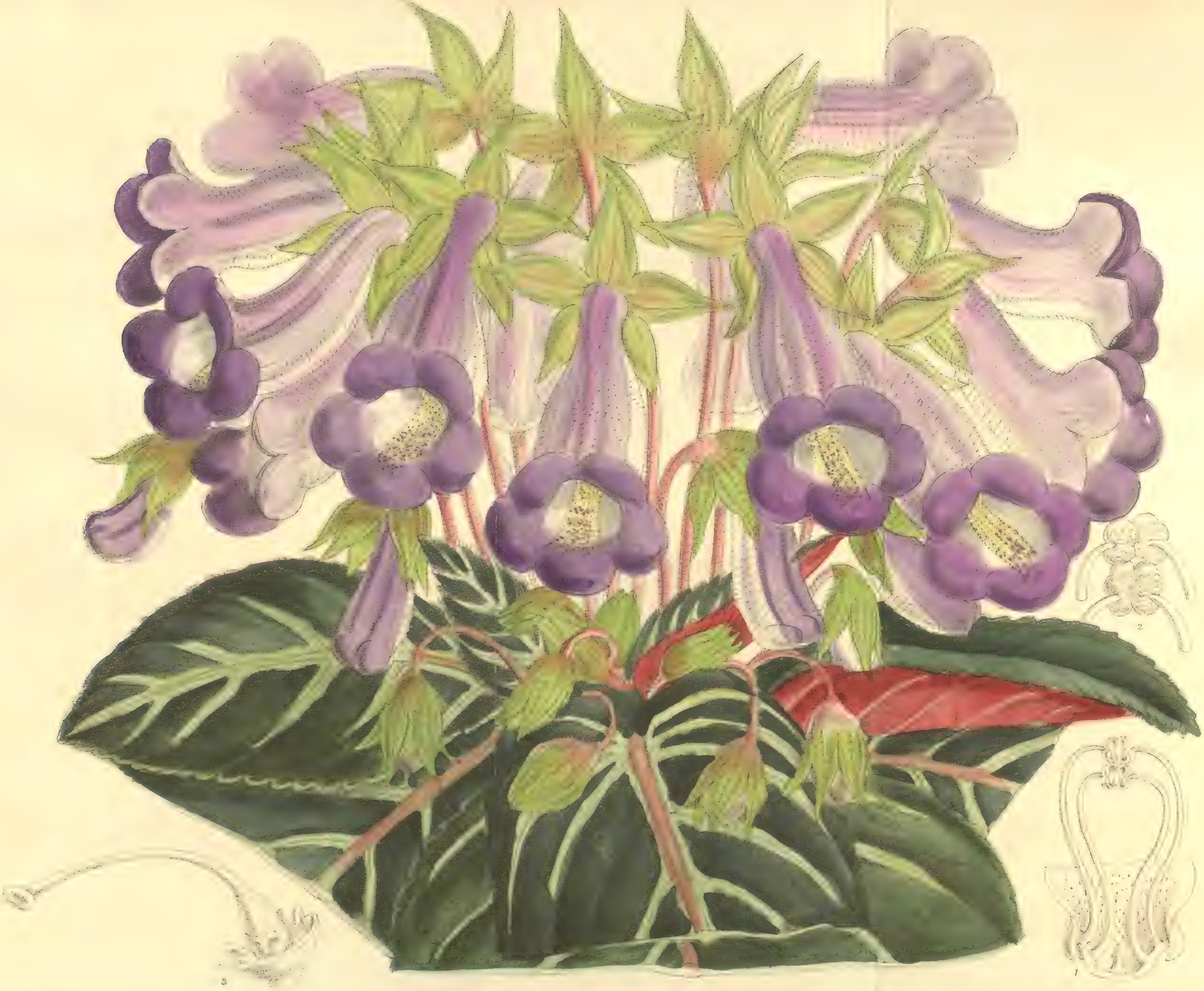

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TAB. 8182.

SINNINGIA REGINA.

Brazil.

GESNERIACEAE. Tribe **GESNERIEAE.**

SINNINGIA, *Nees*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1004.

Sinningia Regina, *Sprague in Gard. Chron.* 1904, vol. xxxvi. p. 87; affinis *S. speciosae*, Hiern, a qua foliis subtus purpureis, calycis lobis minus acuminatis corollaeque forma recedit; aspectu *S. discolori*, Sprague (Gloxiniae discolori, *Decne*), similis, sed indumento, calyce, corolla, glandulis diversis.

Herba carnosula, tubere crasso, caule erecto pubescente purpureo circiter 15 cm. longo, foliorum paribus 4–6. *Folia* ovata vel elliptico-ovata, basi auriculato-cordata, apice obtusiuscula, crenata, 10–22 cm. longa, 6–18 cm. lata, supra subtiliter velutina, in venis albo-variegata, subtus minute puberula, purpurea. *Pedunculi* 4–6 in axillis superioribus una orti, 8–10 cm. longi, patenter hirsuti. *Flores* penduli. *Calycis lobi* patentes, ovato-lanceolati, 1·5–2 cm. longi. *Corolla* violacea, intus antice pallide flavescens et purpureo-guttata; tubus 4–5 cm. longus, supra basin leviter contractus, dein ampliatus, antice ventricosus; lobi patuli, 1 cm. longi, ultra 1 cm. lati. *Stamina* inclusa, antheris connatis, lobis haud confluentibus. *Disci glandulae* 5, oblongae, 2 posticae ceteris crassiores. *Ovarium* dense villosum.—*Gesneria Regina*, Hort. ex Sprague, l.c.

Sinningia Regina resembles *S. discolor* in the colour of its foliage and flowers, but is more closely allied to *S. speciosa*, the wild ancestor of our modern "Gloxinias." Nothing is known of its habitat, except that it was introduced from Brazil. *S. speciosa*, however, grows on rocks by the sea-shore in the State of Rio de Janeiro, according to Gardner, Travels in Brazil, edition 2, p. 22; and Gardner's No. 184 in the Kew Herbarium was found "on rocky places in woods in the Rio Comprido valley" near the town of Rio de Janeiro. *S. speciosa* is recorded also from the Organ Mountains and from Pernambuco, whilst *S. discolor* is known only from the rocky banks of the river Macahé, in the State of Rio de Janeiro, where it was collected by Riedel. See Martius, Flora Brasiliensis, vol. viii. pars 1, pp. 388–389.

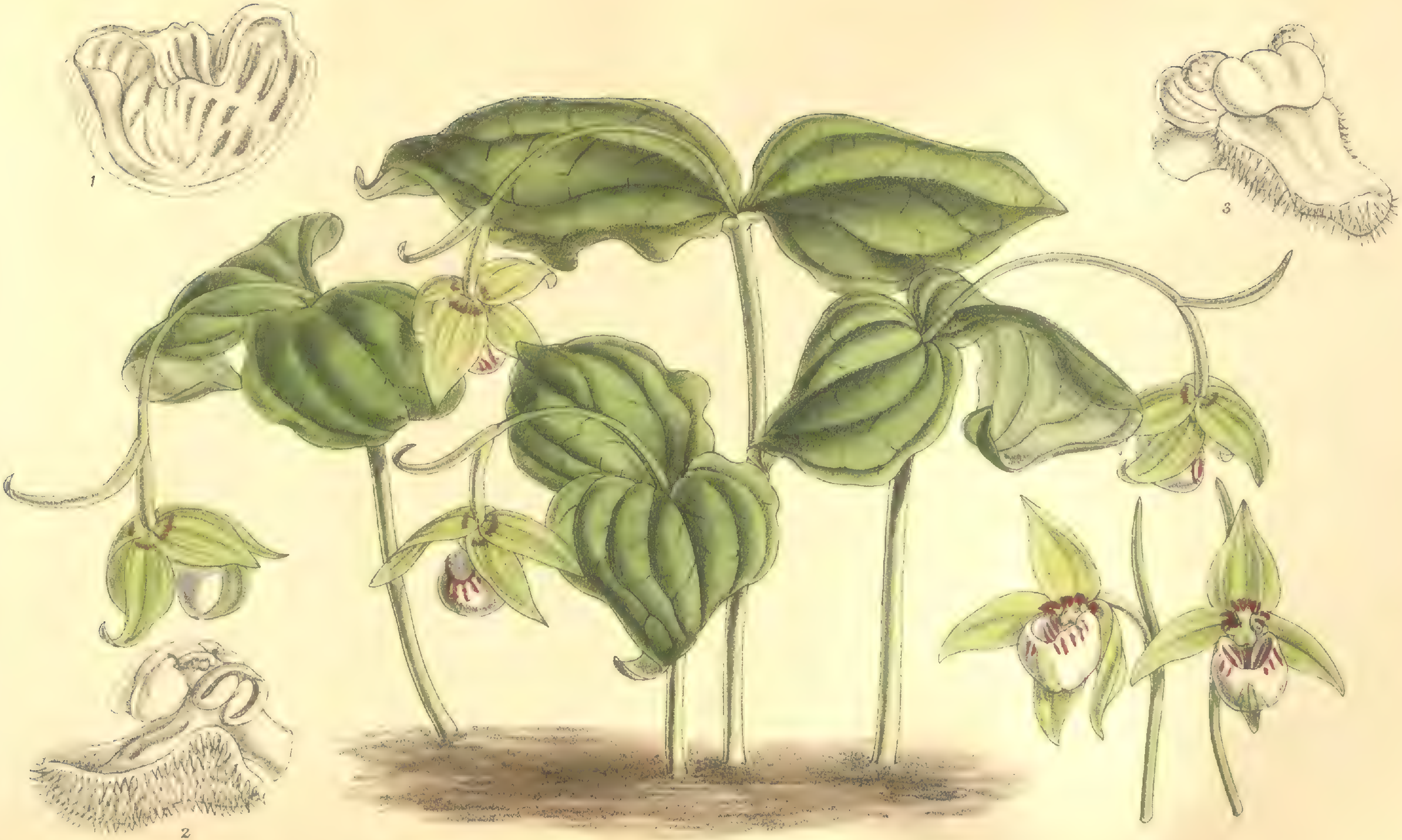
DESCRIPTION.—*Stem* erect, about 6 in. long, springing from a stout tuber, and bearing from 4 to 6 pairs of leaves.

Leaves ovate or elliptic-ovate, 4–8 in. long, 2½–6 in. broad, convex, finely crenate, velvety with short hairs on the upper surface and variegated on the veins, minutely puberulous and purple on the lower. *Peduncles* 3–4 in. long. *Flowers* pendulous, 4–6 in each of the upper axils, from 15 to 20 flowers being out at the same time on a well-developed plant. *Calyx-lobes* spreading, ovate-lanceolate. *Corolla* pale violet, with a pale yellowish band inside which is spotted with purple; lobes patulous, less than ½ in. long. *Stamens* included; anthers connate, lobes not confluent. *Glands* of the disk oblong, the two posticous ones broader than the others. *Ovary* densely villous.—T. A. SPRAGUE.

CULTIVATION.—*Sinningia Regina* was introduced as a chance seedling from Brazil by Mr. de Smet-Duvivier, a nurseryman in Ghent. He exhibited plants of it in flower at the Ghent Quinquennial Exhibition in 1903. With the exception of one plant which was purchased for Kew the stock afterwards became the property of Messrs. Benary, seed merchants, Erfurt, by whom seeds were distributed, not only of *S. Regina*, but also of hybrids between it and garden forms of *S. speciosa*, popularly known as "Gloxinias." The hybrids which were raised by Messrs. Benary are intermediate between the two species. For its cultivation *S. Regina* requires exactly the conditions necessary for "Gloxinias" generally. It is very free-flowering and when well grown is a decidedly showy plant. It seeds freely. Cuttings of the leaves may be used for its propagation as for other Gesneriads. It also has a permanent fleshy tuber from which offsets may be taken.—W. WATSON.

Fig. 1, base of corolla-tube laid open, showing stamens; 2, anthers; 3, pistil and glands of disk:—*all enlarged.*

8183



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TAB. 8183.

CYPRIPEDIUM DEBILE.

China and Japan.

ORCHIDACEAE. Tribe CYPRIPEDIEAE.

CYPRIPEDIUM, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 634; *Pfitzer in Engl. Pflanzenreich, Orch. Pleon.* p. 28.

Cypripedium debile, *Reichb. f. Xen. Orch.* vol. ii. (1874), p. 223; *Gard. Chron.* 1905, vol. xxxviii. p. 442, fig. 166; *Rev. Gen. Bot.* 1901, t. 13, fig. 1–10; *Franch. et Savat. Enum. Pl. Japon.* vol. ii. p. 738; *Matsumura Index Pl. Japon.* vol. ii. p. 241; species nana, diphylla, foliis late ovatis, caulibus scapisque gracilibus glabris, floribus parvis.

Herba terrestris, 10–15 cm. altus. *Caulis* gracilis, glaber, diphyllus. *Folia* opposita, late ovata, acuta, membranacea, 3–6 cm. lata, 3–5–nervia, venis secundariis reticulatis. *Scapi* 2–4 cm. longi, arcuati. *Bracteae* lineares, acutae, 1·5–2·5 cm. longae. *Pedicelli* 1 cm. longi. *Flores* parvi; sepala et petala pallide viridia, basi brunneo-maculata, labellum album ore purpureo-striatum. *Sepalum posticum* ovatum, acuminatum. 1·3–1·5 cm. longum. *Sepala lateralia* connata, ovato-oblonga, subobtusa, 1·2 1·4 cm longa. *Petala* oblonga, acuminata, 1·3–1·5 cm. longa. *Labellum* ovoideo-globosum, 1–1·2 cm. longum, ostio angusto. *Staminodium* spathulatum, cucullatum. —*Calypso borealis,* Somoku Zusetsu, 1856, xviii. t. 85, non Salisb. *C. cardiophyllum*, Franch. et Savat. Enum. Pl. Japon. 1879, vol. ii. pp. 39 et 521.

An anomalous little species, which was originally figured in the Japanese work, Somoku Zusetsu, in 1856, under the name of *Calypso borealis*, a mistake which was pointed out by Reichenbach, in 1874, when he briefly described the plant under the name of *Cypripedium debile*; his description being based solely upon this old figure. Five years later Franchet and Savatier described a species under the name of *C. cardiophyllum*, basing it chiefly on a specimen collected on Fudsiyama, in the province of Nippon, by Savatier. They cited, however, the old figure above mentioned, and a still earlier one, in the Japanese work, Honzo Zufu, published in 1828, where it appeared without any botanical name. A reference to the work, however, shows a thoroughly characteristic coloured figure, with both flowers and young fruit. It is now known from several Japanese localities, and has also been found by Père Farges

MARCH, 1908.

in Western China, in the Tchen-kéou-tin district of the province of Szechuen. A single plant has also been collected by Mr. E. H. Wilson, at an altitude of 7,000 feet in the same province, though the precise locality has not been stated.

DESCRIPTION.—*Herb*, terrestrial, 4–6 in. high. *Stem* slender, glabrous, two-leaved. *Leaves* broadly ovate, acute, membranous, $1\frac{1}{4}$–$2\frac{1}{2}$ in. broad, with three to five primary nerves, secondary veins reticulated. Scapes $\frac{3}{4}$–$1\frac{3}{4}$ in. long, arching. *Bracts* linear, acute, $\frac{1}{2}$–1 in. long. *Pedicels* over $\frac{1}{3}$ in. long. *Flowers* small, with pale green sepals and petals, each bearing a dark brown blotch at the base, forming a zone round the column, sometimes striped with brown, and with a white lip streaked with purple round the mouth. *Dorsal sepal* ovate, acuminate, $\frac{1}{2}$–$\frac{3}{4}$ in. long; *lateral sepals* connate into an ovate-oblong, subobtuse limb, slightly longer than the dorsal. *Petals* oblong, acuminate, as long as the dorsal sepal. *Lip* ovoid-globose, nearly $\frac{1}{2}$ in. long, much narrowed at the mouth. *Staminode* spathulate, cucullate.—R. A. ROLFE.

CULTIVATION.—Roots of this interesting little orchid were purchased from the Yokohama Nursery Company. They were planted in pans of leaf-mould and chopped sphagnum and kept in an unheated frame where they flowered in April. Although lacking the attractions of size and colour so usual in the genus, *Cypripedium debile* has charms of its own, and is quite worthy of a place among select "Alpines." It is probably sufficiently hardy to be grown permanently in the open air, although, owing to their pose, the flowers would be practically hidden unless the plants were set on the high ledge of a rockery, or grown, as at Kew, in a pan and placed whilst in flower on the stage of a greenhouse.—W. WATSON.

Fig. 1, side of lip, in section; 2 and 3, side and front views of column:—*all enlarged.*

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TAB. 8184.

PYRUS ARIA, var. MAJESTICA.

Garden Origin?

ROSACEAE. Tribe POMEAE.

PYRUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 626.

Pyrus (Sorbus) **Aria,** *Ehrh.*, var. **majestica**; varietas ab aliis varietatibus speciei aliquanto variabilis foliis floribusque majoribus distinguenda.

Arbor erecta ramis ascendentibus, 10–15 m. alta; cortex primo tomento pallido obsitus, cito tamen glabrescens, demum glaber, nitidus, fuscus. *Folia* decidua, ovata vel elliptica vel obovata, 8–18 cm. longa, 4–9 cm. lata, apice obtusata, margine inordinaliter duplicato-serrata, supra primo floccosa demum glabra, nitida, intense viridia, subtus dense albo-tomentosa, nervi prominuli plus minusve paralleli. *Flores* 2 cm. lati, in corymbos terminales axillaresque aggregati; corymbi plani, 8–10 cm. lati; pedicelli lanati; bracteae subulatae, cito deciduae. *Calyx* campanulatus, 5-lobus; limbus 1 cm. latus; lobi trianguli, persistentes. *Petala* patentia, subconcava, ovato-orbicularia, albida. *Stamina* stylos excedentia. *Stylus* basi lanatus. *Poma* in corymbos laxiusculos demum nutantes disposita, globosa, 1·25 cm. lata, matura intense rubra.—*P. lanata*, Hort. non D. Don. *P. Decaisneana*, Nichols. in Kew Hand-list of Trees and Shrubs, ed. 1, p. 187. *Aria majestica*, Lavall. in Arb. Seg. Enum. p. 98. *A. Decaisneana*, Lavall. l.c. Icon. t. 18. *Sorbus Aria*, Crantz, var. *majestica*, Zabel in Beissner, Handb. der Laubholz Benennung, p. 198.—D. PRAIN.

There is no more characteristic tree on the chalk hills of west and south Britain than the Whitebeam, *Pyrus Aria*. Its flowers are attractive and its fruits are especially so, but its beauty and distinctness are never greater than when the wind, by lifting the branches, reveals the white under-surface of the leaves. *Pyrus Aria* is only surpassed in this respect among British trees by the Abele, *Populus alba*.

As here, and as generally limited, *Pyrus Aria* includes numerous varieties, some of which are so distinct as to be regarded by some authors as separate species. The one represented in our plate is, perhaps, the most ornamental of them all; its leaves, corymbs and fruits are larger than in any other variety.

The origin of this fine variety is unknown. The statement that it is a native of Nepal appears to be without

MARCH, 1908.

confirmation, and probably arose from its confusion with *P. lanata*, D. Don., a tree absolutely distinct. There is no specimen in the Kew Herbarium from North India that matches the plant now figured. It is identical with *Aria Decaisneana*, Lavall., which is known to have existed in the Arboretum of Segrez in 1858. The late Mr. Lavallée states that his tree was known in the nurseries near Paris as the "Sorbier du Népaul." The most probable explanation of its origin is that it is an improved variety raised under cultivation. The tree from which the figure was made has long been growing in the Kew Arboretum, where it flowers and fruits freely almost every year. The severest cold does not hurt it.

DESCRIPTION.—*Tree*, ultimately 40 ft. or more high with suberect branches. *Bark* at first covered with a pale tomentum, finally glabrous and dark lustrous brown. *Leaves* 3–7 in. long, half as much wide, ovate to oval or obovate, obtuse, irregularly serrate, white-felted beneath, flocculent above when young, but lustrous-green and glabrous later; veins parallel, prominent. *Flowers* in terminal and axillary corymbs three to four inches across, pedicels woolly. *Bracts* subulate, fugacious. *Calyx* $\frac{3}{8}$ in. in diameter, woolly, with triangular persistent lobes. *Corolla* $\frac{3}{4}$ in. across; petals ovate-orbicular, concave, dull creamy white. *Style* woolly at base, shorter than stamens. *Stamens* about twenty. *Fruit* in loose corymbs, ultimately nodding, globose, $\frac{1}{2}$ in. in diameter, bright red.—W. J. BEAN.

Fig. 1, bud; 2, section of calyx and pistil; 3 and 4, seeds:—*all enlarged except 3.*

8185

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TAB. 8185.

BERBERIS ACUMINATA.

China.

BERBERIDACEAE.

BERBERIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 43.

Berberis acuminata, *Franch. in Bull. Soc. Bot. France*, vol. xxxiii. p. 387; *B. Wallichianae*, DC., affinis, sed foliis angustioribus longe acutatis vel acuminatis magis et longius spinoso-serratis, spinis firmioribus differt.

Frutex sempervirens 1-2 m. altus, glaberrimus; rami cortice pallido vel cinerascente tecti. *Folia* lanceolata, longe acutata vel acuminata, spinoso-serrata, 5-10 cm. longa, 0·6–2 cm. lata, coriacea, anguste calloso-marginata, spinulis 1·5-3 mm. longis prorsus directis firmis; spinae tripartitae, 10–15 mm. longae, patentes. *Florum fasciculi* 2–15 (plerumque 5–9)-flori, perulis ovatis acuminatis subpungentibus; pedicelli graciles, 15-20, raro ad 30 mm. longi. *Sepala* 6, exteriora 2-2·5 mm. interiora 5-6 mm. longa, omnia suborbicularia. *Petala* obovato-orbicularia, sepala interiora aequantia, luride aurea. *Stamina* quam petala triente breviora. *Stigma* subsessile, pileiforme. *Bacca* nigra, glauco-pruinosa, ellipsoidea, 8-10 mm. longa, 5–6 mm. diametro.

Berberis acuminata was discovered by Delavay in woods near Tcheng-fong-chau, Yunnan, in 1882. Since then it has been collected by Dr. A. Henry and Mr. E. H. Wilson in the mountains of Western Hupeh, where it is, however, according to the latter collector, who found it growing on grassy slopes at from 5,000 to 6,000 feet above sea-level, very rare. The specimens from which the plate was prepared were communicated by Messrs. James Veitch and Sons, who raised plants from seeds obtained on their behalf by Mr. Wilson. These plants flowered at Coombe Wood in May, 1907. The most nearly allied species, *Berberis Wallichiana*, is a native of the Temperate Himalaya, from Nepal eastwards. It differs mainly in having relatively broader leaves with less tapering tips and much smaller marginal spines.

DESCRIPTION.—*Shrub*, evergreen 3–6 feet high; bark of the young branches pale or greyish. *Leaves* lanceolate, long tapering towards the tips or acuminate, spinous-serrate,

MARCH, 1908.

2–4 in. long, $\frac{1}{4}$–$\frac{3}{4}$ in. broad, coriaceous, with a narrow callous margin and numerous sharp spines which are directed forwards and are up to $\frac{1}{8}$ in. long; spines at the bases of the leaf-tufts tripartite, $\frac{1}{2}$–$\frac{2}{3}$ in. long. *Flowers* in fascicles of 2–15, usually 5–9, from winterbuds the scales of which are ovate, with sharp points; pedicels slender, $\frac{2}{3}$–2 in. long, or even longer. *Sepals* 6, the outer $\frac{1}{12}$ in. long, the inner up to $\frac{1}{4}$ in. long, all suborbicular. *Petals* obovate-orbicular, as long as the inner sepals, brownish yellow. *Stamens* one-third shorter than the petals. *Stigma* subsessile, pileiform. *Berry* black with a glaucous bloom, ellipsoid, $\frac{1}{3}$–$\frac{5}{8}$ in. long, $\frac{1}{4}$ in. wide.—OTTO STAPF.

Fig. 1, leaf margin; 2, flower; 3, petal and stamen; 4, petal; 5, pistil:—*all enlarged.*

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TAB. 8186.

ROSA WILLMOTTIAE.

China.

ROSACEAE. Tribe ROSEAE.

ROSA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 625.

Rosa (§ Cinnamomeae) **Willmottiae,** *Hemsl. in Kew Bull.* 1907, p. 317, descriptio hic iterata; species ex affinitate *R. Webbianae*, Wall., a qua aculeis aequalibus, calyce eglanduloso, sepalis quam petalis multo brevioribus et petalorum colore differt.

Frutex dense ramosus, 1·5–3 m. altus, praeter stipulas fere glaber, ramis gracilibus brunneo-rubris. *Aculei* in ramis floriferis geminati, recti, 8–10 mm. longi, pallidi, setis nullis. *Folia* conferta, 2–3 cm. longa; rhachis gracillima, minutissime setulosa; stipulae minutae, supra medium liberae, apice obtusae, margine eximie glanduloso-ciliatae. *Foliola* saepissime 9, brevissime petiolulata, oblonga, obovata vel interdum fere orbicularia, 4–8 mm. longa, praecipue supra medium subduplicato-denticulata. *Flores* roseo-lilacini vel roseo-purpurei, alabastris saturate rubris, 3·5–4 cm. diametro, in ramulorum brevium apicibus solitarii, brevissime pedunculati. *Sepala* lanceolata, caudato-acuminata, circiter 1 cm. longa, integra, intus albo-tomentosa. *Petala* subintegra. *Filamenta* brevissima, antheris aureis. *Styli* hirsuti, liberi. *Achaenia* dorso villosa. *Fructus* maturus nobis ignotus.

This very pretty rose was raised by Messrs. James Veitch and Sons from seed collected by Mr. E. H. Wilson in the Sangpan mountains, near the Tibetan frontier of Western China, at elevations of 9500 to 11,000 ft., and the plate was prepared from specimens communicated by that firm, from plants which flowered at Coombe Wood in May, 1907. The most nearly allied species, *R. Webbiana*, is a native of the drier regions of the western temperate Himalaya.

DESCRIPTION.—*Shrub*, densely branched, 5–10 ft. high, nearly glabrous, except the stipules. *Branches* slender, red-brown. *Prickles* in pairs on the flowering branches, straight, $\frac{2}{8}$–$\frac{3}{8}$ in. long, pale; bristles none. *Leaves* crowded, $\frac{3}{4}$–$1\frac{1}{4}$ in. long; midrib slender, obscurely setulose; stipules small, fringed with glandular hairs.

MARCH, 1908.

Leaflets usually 9, very shortly stalked, oblong, obovate or sometimes nearly orbicular, $\frac{1}{4}$–$\frac{1}{2}$ in. long, toothed above the middle. *Flowers* purple-rose, bright red in bud, 1–1$\frac{1}{4}$ in. across, solitary on short, lateral branches, very shortly stalked. *Sepals* lanceolate, taper-pointed or caudate, about $\frac{1}{2}$ in. long, entire, clothed with a white felt inside. *Petals* entire or obscurely notched. *Filaments* very short; anthers yellow. *Styles* hairy, free. *Achenes* hairy on the back. *Fruit* not seen.—W. Botting Hemsley.

Fig. 1, base of a leaf and stipules; 2, section of a flower from which the petals have been removed; 3, a carpel:—*all enlarged.*

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CONTENTS OF No. 39, MARCH, 1908.

TAB. 8182.—SINNINGIA REGINA.
„ 8183.—CYPRIPEDIUM DEBILE.
„ 8184.—PYRUS ARIA, *var.* MAJESTICA.
„ 8185.—BERBERIS ACUMINATA.
„ 8186.—ROSA WILLMOTTIAE.

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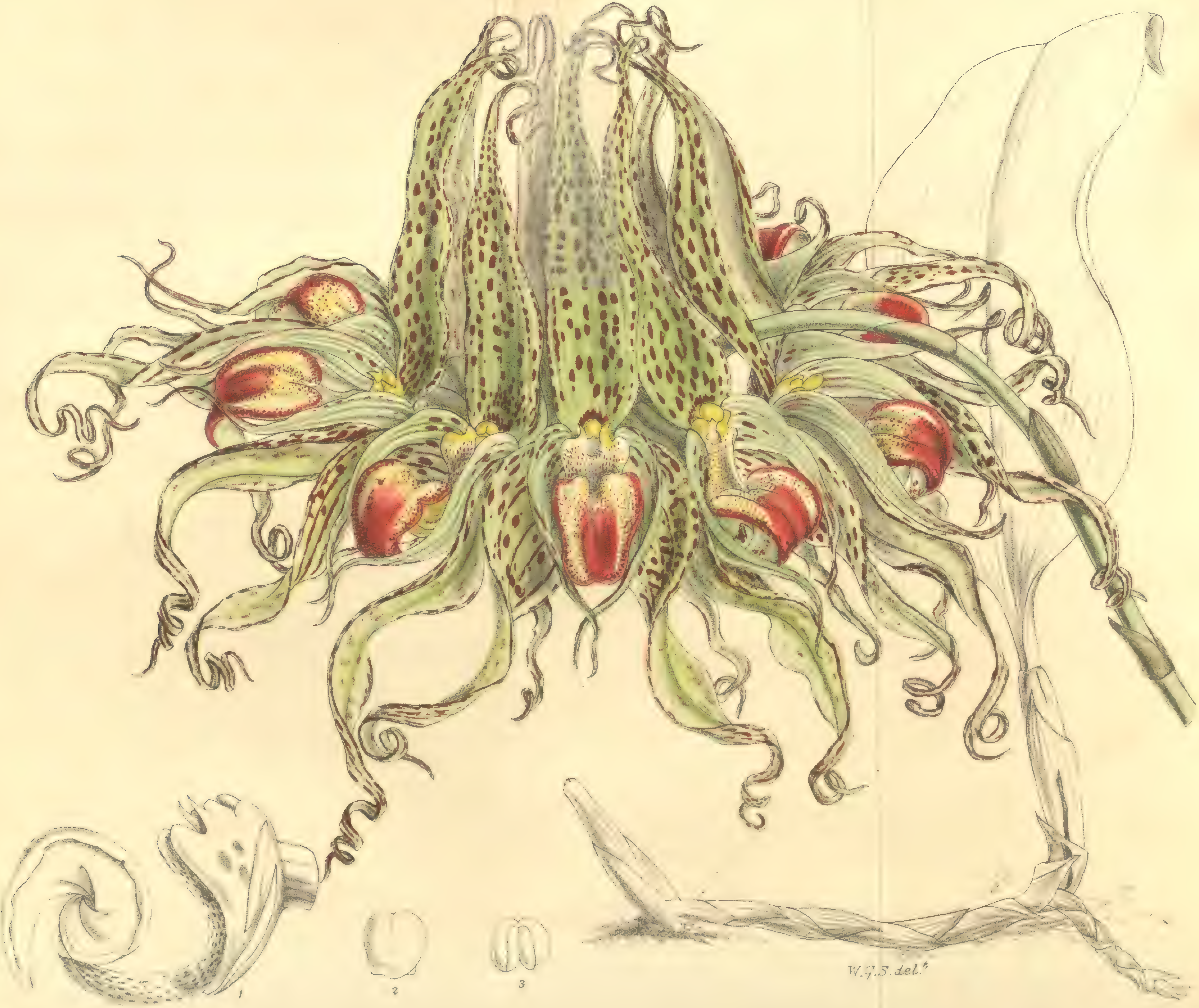
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TAB. 8187.

BULBOPHYLLUM BINNENDIJKII.

Java.

ORCHIDACEAE. Tribe EPIDENDREAE.

BULBOPHYLLUM, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 501; *Pfitzer in Engl. Pflanzenf.* vol. ii. 6, p. 286.

Bulbophyllum Binnendijkii, *J. J. Smith, Orch. Jav.* (1905), p. 442; *Rothschild in Gard. Chron.* 1907, vol. xlii. p. 161; species insignis, a *B. Ericssoni,* Kraenzl., partibus fere omnibus majoribus differt.

Herba epiphytica. *Rhizoma* validum; internodia circa 15 cm. longa, vaginis ovato-oblongis acutis tecta. *Pseudobulbi* oblongi, circa 13 cm. longi, basi vaginis spathaceis acuminatis tecti, monophylli. *Folia* petiolata, late oblonga, acuta, circa 30 cm. longa, 13 cm. lata; petiolus 4 cm. longus. *Scapi* e basi pseudobulbi producti, patentes, circa 15 cm. longi, vaginis spathaceis acutis tecti. *Flores* umbellati, speciosi, virides, brunneo-maculati, labello pallidiore facie rubro-suffuso et ornato. *Bracteae* ovatae, acuminatae, 1·5–2 cm. longae. *Pedicelli* circa 2 cm. longi. *Sepalum* posticum erectum, late lanceolatum, caudato-acuminatum, apice spiraliter tortum, 7–9 cm. longum; sepala lateralia patentia, oblongo-lanceolata, caudato-acuminata, apice spiraliter torta, 7–9 cm. longa. *Petala* basi oblongo-lanceolata, apice longe caudato-acuminata et spiraliter torta, 3–4 cm. longa. *Labellum* recurvum, basi late oblongum, apice longe acuminatum, circa 2 cm. longum. *Columna* brevis, lata, dentibus brevibus, basi in pedem longum attenuatum producta.—*Cirrhopetalum leopardinum,* Teijsm. et Binn. in Nat. Tijdschr. Ned. Ind. 1862, vol. xxiv. p. 309. *Bulbophyllum Ericssoni,* Rolfe in Orch. Rev. 1907, p. 233, fig. 27 (non Kraenzl.).

This striking species has a curious history, and its identity is by no means certain. It was exhibited by Messrs. Sander & Sons at the Temple Show in May, 1907, under the name of *Bulbophyllum Ericssoni,* and it was also figured from a photograph; but the Hon. Walter Rothschild, who possesses the original type plant, did not admit the determination, and considered it to be identical with *B. Binnendijkii,* J. J. Smith. A dried flower of Messrs. Sander's plant has been sent to Mr. Smith, who replies that his description of *B. Binnendijkii* was made from a dried specimen in the Leiden Herbarium, the colour being added from a plant that was in cultivation at the Buitenzorg Botanic Garden some eighteen years ago. It had been brought in by a native

collector, probably from Mt. Salak, near Buitenzorg, and it flowered once and then died. *Cirrhopetalum leopardinum*, Teijsm. and Binn., came from Mt. Salak, and Mr. Smith says that the two must be identical. Recently Mr. Smith received an inflorescence of a *Bulbophyllum* from Soekaboemi which he considers identical with the one preserved at Leiden, and of which he sends a dried flower. This is smaller than that of the plant figured, which Mr. Smith remarks has the dimensions of his *B. virescens*, but he adds:—"I am very much inclined to believe that *B. virescens* and *B. Ericssoni* are only colour variations of the same species, and perhaps *B. Binnendijkii* will hardly be maintained as a species." Except in the larger dimensions, the present plant is so similar to that previously figured in this work (t. 8088) that it seems advisable to wait for more complete materials before attempting to decide the question. It is unfortunate that the type specimens are not available for comparison. *Cirrhopetalum leopardinum* was originally met with on Mt. Salak, growing on the trunks of trees in the high forest. The altitude is not stated, but the mountain is said to be 6970 ft. high. The specific name first employed had to be changed because there is an earlier *B. leopardinum*, of Lindley. It is curious that so striking a plant should have so long remained practically unknown.

Description.—*Herb*, epiphytical; rhizomes strong, creeping; internodes about 6 in. long, covered with ovate-oblong acute sheaths. *Pseudobulbs* oblong, about 5½ in. long, covered with spathaceous acuminate sheaths at the base, 1-leaved. *Leaves* petioled, broadly oblong, acute, about 1 ft. long, by 5½ in. broad; petiole ¾ in. long. *Scape* produced from base of pseudobulb, spreading, about 6 in. long, with a few spathaceous, acute sheaths. *Flowers* umbellate, about seven to ten, very large, light green, spotted with dark brown, the lip paler, suffused and marbled with reddish purple on the face. *Bracts* ovate, acuminate, about ¾ in. long. *Pedicels* nearly 1 in. long. *Dorsal sepal* erect, broadly lanceolate, caudate-acuminate, spirally twisted at the apex, 3–4 in. long; lateral sepals spreading, oblong-lanceolate, caudate-acuminate, spirally twisted at the apex, 2¾–3½ in. long. *Petals* oblong-lanceolate, spirally twisted at the apex, 1½–2 in. long. *Lip* strongly recurved, broadly oblong at the base, long acuminate at the apex, nearly 1 in. long. *Column* short, broad, with short, broadly oblong teeth, base prolonged into a long attenuated foot.—R. A. ROLFE.

CULTIVATION.—The section of *Bulbophyllum* to which *B. Binnendijkii* and *B. Ericssoni* belong does not grow well at Kew. Messrs. Sander & Sons, St. Albans, who grew the fine example shown at the Temple Show last year from which the present figure was prepared, state that this species grows well in a moist tropical house where during the season of growth it is kept saturated and allowed a fair amount of sunshine and air on favourable days. When at rest only sufficient water is given to keep the soil from becoming quite dry. In a dry atmosphere the leaves are attacked by "spot," especially during winter. The mixture used is sphagnum moss with a small portion of peat fibre, dead leaves, small crocks and silver sand. The best plants were grown in shallow teak baskets, suspended near the glass in a house containing *Coelogyne pandurata*, *Arachnanthe Lowii*, etc. All the *Bulbophylla* with thin rhizomes and pseudobulbs and papery leaves appear to require the conditions here given, and even then they are not always healthy. Of the many plants of the allied *B. Ericssoni* imported by Messrs. Sander & Sons it is doubtful if a score are now alive.—W. WATSON.

Fig. 1, lip and column; 2, anther cap; 3, pollinia:—*all enlarged*; 4, whole plant, from a sketch by Worthington G. Smith:—*much reduced.*

M. S del. J.N Fitch lith.

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TAB. 8188.

KAEMPFERIA KIRKII, var. ELATIOR.

Rhodesia.

ZINGIBERACEAE. Tribe HEDYCHIEAE.

KAEMPFERIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 641; *K. Schum. in Engler, Pflanzenreich*, vol. iv. pars 66, p. 64.

Kaempferia Kirkii, *K. Schum.*, var. **elatior,** *Stapf*; a typo (*Cienkowskia Kirkii*, Hook. f.) statura elatiore, foliis longioribus pro ratione angustioribus basi longius attenuatis, pedunculis elatioribus, labelli maculo fauciali aureo utrinque purpureo-notato differt.

Herba perennis cum foliis ad 45 cm. alta. *Folia* oblanceolata vel oblanceolato-oblonga, acuminata, basi saepe longe attenuata, lamina ad 30 cm. longa, 5–8 cm. lata, amoene viridia, subtus pallidiora; petioli inferne vaginantes, ad 15 cm. longi. *Caulis* florens cum foliis coëtaneus, ad 35 cm. longus; spica brevis, 4–5-flora; pedunculus paucisquamatus; bracteae lanceolatae, cymbiformes, 2–3 cm. longae; pedicelli inferiores ad 1·3 cm. longi. *Calyx* superne leviter dilatatus, 3-dentatus, 10–12 mm. longus. *Corolla* albida; tubus ad 15 mm. longus; lobi oblongo-lanceolati, inaequilati, circiter 25 mm. longi, latissimus 10 mm. latus. *Staminodia* oblique obovata, rosea, parte libera 3–3·5 cm. longa, ad 3 cm. lata. *Labellum* roseum, latissimum, 4 cm. longum, 7 cm. latum, bilobum, sinu ad 15 mm. alto, basi maculo aureo utrinque late purpureo-marginato ornatum. *Filamentum* breve; connectivum ultra antheram 6 mm. longam in appendicem apice subemarginatam ad 18 mm. longam 8 mm. latam superne auream productum. *Ovarium* vix 10 mm. longum.

This beautiful plant belongs to a group of very closely allied forms which are spread all over tropical Africa. They are unfortunately very difficult to discriminate in the dry state unless prepared with particular care and represented by very complete specimens; and next to nothing is known about their range of variation under natural conditions. K. Schumann, in his elaboration of the Zingiberaceae in Engler's Pflanzenreich, recognises three species in this group, whilst Gagnepain in a recent paper (Bull. Soc. Bot. France, 1905, p. 537) treats two of them, *K. rosea* and *K. Kirkii*, as synonymous; but if this is correct, *K. Carsoni* will also have to be reduced to *K. Kirkii*. A fourth species with very narrow leaves was described simultaneously (July, 1906) by N. E. Brown as *K. Cecilae* and by

Gagnepain as *K. kilimanensis*, from Portuguese East Africa. It differs much more from the three other forms of the group than these differ from each other, and has consequently a better claim to the status of a species. Whether the plant figured here, so far only known from a single specimen, is actually more than a state of a very polymorphic and plastic species can only be decided by observation in the field and by experiment. The flowers of *K. Kirkii*, as figured in B. M., t. 5994, have a slightly emarginate labellum with a simple yellow blotch at the throat, while in the variety *elatior* the labellum is bilobed with a narrow sinus up to 15 mm. deep and a yellow blotch bordered on both sides by a purple marking. A coloured sketch, however, drawn on the spot by Sir John Kirk, shows the labellum of the type 2-lobed with a simple yellow blotch. The same marking is present in the Kew specimens of *K. Kirkii* from British and German East Africa and of the cultivated plant, whilst all the specimens of *K. rosea* and *K. Carsoni* have purple lateral markings as in the var. *elatior* figured here.

The drawing was made from specimens presented by Mr. H. J. Elwes of Colesborne, Cheltenham.

DESCRIPTION.—*Herb*, perennial, 12–18 in. high. *Leaves* more or less oblanceolate, acuminate, long attenuated at the base, bright green above, paler below; blade up to 12 in. by 2–3 in.; petiole sheathing below, up to 6 in. long. *Flowering stem* appearing with the leaves, about 14 in. long; peduncle with few scales; spike 4–5-flowered, short; bracts lanceolate, boat-shaped, 1 in. long; lower pedicels up to ½ in. long. *Calyx* 3-toothed, ½ in. long. *Corolla* whitish; tube over ½ in. long; lobes oblong-lanceolate, the largest under 1 in. long, less than ½ in. broad. *Staminodes* and *labellum* bright rose-colour, the latter 1¾ in. long and almost 3 in. broad, two-lobed, with a narrow sinus and a yellow blotch bordered by a purple marking on each side. *Filament* short; connective petaloid, slightly emarginate, yellow in the upper part; anthers ¼ in. long. *Ovary* less than ½ in. long.—OTTO STAPF.

Fig. 1, stamen; 2, ovary; 3, stigma; 4, whole plant:—*all enlarged, excepting fig. 4, which is reduced.*

M. S. del. J. N. Fitch lith.

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Tab. 8189.

SAXIFRAGA Brunoniana.

India.

Saxifragaceae. Tribe Saxifrageae.

Saxifraga, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 635; *Engl. Monogr.* p. 223.

Saxifraga (§ Trachyphyllum) **Brunoniana,** *Wall. Cat.* n. 444; *Sternb. Revis. Saxifr. Suppl.* t. 23; *Hook. f. Fl. Brit. Ind.* vol. ii. p. 397; *Engl. Monogr.* p. 223; species ex affinitate *S. flagellaris,* Willd. (B. M. t. 4621), a qua habitu graciliore, floribus minoribus longius pedicellatis et petalis oblongo-spathulatis differt.

Herba perennis, caespitosa, stolonifera, praeter setulas ad foliorum margines fere omnino glabra, caulibus stolonibus pedicellisque gracillimis rubris. *Caules floriferi* 5–15 cm. alti. *Folia* rigida, cartilaginea, lineari-lanceolata, 0·5–2·5 cm. longa, mucronata, setuloso-ciliata, inferiora conferta, caulina minora, sparsa, interdum in axillis gemmifera. *Pedunculi* pedicellique obscure glandulosi, floribus multo longiores. *Calycis segmenta* ovata, obtusa, circiter 2 mm. longa. *Petala* lutea, angusta, oblonga, 7–8 mm. longa, obtusa. *Stamina* petalis dimidio breviora, alternis brevioribus; antherae rubrae. *Capsula* globosa.—*S. Brunonis,* Wall. ex Ser. in DC. Prodr. vol. iv. p. 45.

As explained by Engler in his admirable monograph published thirty-five years ago, *S. Brunoniana*, *S. pilifera*, Hook. f. & Thoms. and the widely distributed *S. flagellaris* differ from all the other species of the section *Trachyphyllum* in developing from the axils of the lower leaves thread-like runners, which bear leaf-buds at their tips and strike root, finally becoming independent plants, which flower the following year. *S. Brunoniana* has a wide range in the Himalaya mountains at elevations of 9000 to 13,000 ft., from Sikkim to Kashmir. In the Flora of British India it is recorded from 16,000 ft., but this is probably a slip, as none of the numerous specimens in the Herbarium are noted from so high a level. *S. pilifera*, its nearest ally, differs in having obtuse leaves and smaller flowers, the petals scarcely exceeding the sepals; it has only been found in Sikkim, at elevations of 14,000 to 15,000 ft.

April, 1908.

Description.—*Herb*, perennial, tufted, producing numerous, very slender runners, which give rise to independent plants; with the exception of the marginal bristles of the leaves, almost glabrous. *Stems*, runners, and flower-stalks very slender, bright red; flowering-stems 2–6 in. high. *Leaves* stiff, cartilaginous, narrow-lanceolate, $\frac{1}{3}$–1 in. long, sharp-pointed, margin fringed, lower ones crowded, upper smaller, scattered, sometimes bearing bulblets in the axils. *Flower-stalks* much longer than the flowers, furnished with small inconspicuous glands. *Sepals* ovate, obtuse, about $\frac{1}{12}$ in. long. *Petals* yellow, narrow, oblong, about $\frac{1}{3}$ in. long, obtuse. *Stamens* ten, shorter than the petals, alternate ones shorter; anthers red. *Capsule* very small, globose.—W. Botting Hemsley.

Cultivation.—Seeds of this charming little *Saxifraga* were received in 1903 from the Royal Botanic Gardens, Sibpur, Calcutta. The plants have proved hardy at Kew, growing freely in the rock garden, but they are seen at their best when cultivated in a pan of light stony soil in a cold frame and placed in a greenhouse whilst in flower. The bright crimson colour of the stems and stolons is at least as attractive as the flowers. The stolons, which are slender, twist about in such a manner as to produce the effect of one of the dodders growing over a dwarf *Saxifraga*. Another species with the same habit is *S. flagellaris*, but in that the stems and stolons are green.—W. Watson.

Fig. 1, a leaf from a rosette; 2, a stem-leaf; 3, calyx and pistil; 4, a petal; 5 and 6, stamens:—*all enlarged.*

8190

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RHEUM INOPINATUM.

Tibet.

Polygonaceae. Tribe Rumiceae.

Rheum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 100.

Rheum inopinatum, *Prain*; species *R. racemifero*, Maxim., magis affinis, statura tamen minore, thyrsis omnibus simplicibus, staminibus calycis lacinias haud carinatas apice nequaquam cucullatas manifeste excedentibus, fructusque alis rigidulis disco latioribus differt.

Herba perennis, rhizomate valido 2 cm. crasso. *Caulis* gracilis, ruber, parce scabridus, 25–35 cm. altus, 0·5 cm. crassus. *Folia* coriacea, plus minusve bullata, plurima basilaria, subrosulata, caulina saepe 0, nonnunquam 1, raro 2, supra nervis rubescentibus parce scabridis exceptis pallide viridia, subtus nervis rubidis scabridis exceptis viridi-glauca, basi truncata vel cordata, ibique 3–5-nervia, nervo primario medio secundarios 8–10 pinnatim emittente, lateralibus secundarios 4–6 versus marginem excurrentes emittentibus, apice rotundata, margine parum sinuata et minute crenulata, 8–15 cm. longa, 5–12 cm. lata; petiolus semicylindricus, rubidus, 4–10 cm. longus, praesertim subtus scabridus. *Inflorescentia* paniculata, e thyrsis racemiformibus e quavis axilla solitariis 5–12 cm. longis composita, florifera fastigiata, fructifera pyramidata, 15–25 cm. longa, 7–12 cm. lata. *Flores* fasciculati, pedicellis gracilibus 4–5 mm. longis infra medium articulatis breviores. *Calycis laciniae* oblongae, obtusae, 3 mm. longae, staminibus breviores. *Stamina* saepissime 9, quorum 3 exteriora interioribus 6 parum longiora. *Achaenia* e basi cordata orbicularia, triptera, rubra, 10–12 mm. longa lataque, alis margine subintegris, nervo a margine remoto.

The late Mr. Maximowicz in promising a review of the species of *Rheum* (Mel. Biol. xi. 686, footnote) which his untimely death prevented him from completing, has suggested as useful the subdivision of the genus into two groups; the *Monticolae* with leafy stems and membranous leaves, and the *Deserticolae*, with stems leafless, or nearly so, and firm leaves.

It is to the latter group that the species here figured belongs. In habit and general facies it much resembles another species of the same group, *R. racemiferum*, Maxim., from Southern Mongolia, but differs in its smaller size and in the other particulars already noted. Another species,

also of this group, which has much in common with *R. inopinatum*, is *R. Delavayi*, Franch., from Yunnan, but in this species the leaves differ in shape, the stamens are included and the achene-wings are thinly membranous.

Description.—*Herb*, perennial; rootstock ¾ in. thick. *Stem* slender, red, 10 in. to a little over 1 ft. high. *Leaves* firm, somewhat bullate, mostly basal and spreading, occasionally one or two on the stem above the base; nerves red and scabrid on both sides, otherwise smooth and rather pale green above, glaucous green beneath; truncate or cordate at the base where 3–5-nerved; middle nerve pinnately 8–10-branched, lateral nerves 4–6-branched on the outer side only; rounded at the wide apex, very slightly sinuate and throughout finely crenate, 3–6 in. long, 2–5 in. wide; petiole flattened above, reddish, 1½–4 in. long, somewhat scabrid, especially on the rounded lower side. *Inflorescence* paniculate; branches simple; raceme-like thyrses of fascicled flowers with slender pedicels jointed below the middle; panicles 6–10 in. long, 2½–5 in. across; branches 2–5 in. long fastigiate in flower, in fruit forming a pyramidal mass; pedicels about ⅙ in. long. *Calyx*-lobes oblong, obtuse, ⅛ in. long. *Stamens* usually 9, 3 outer rather longer than the other six, all exserted. *Nutlets* orbicular, cordate below, three-winged, rather bright red, nearly ½ in. across; wings subentire with a strong nerve some distance with the edge.

Cultivation.—*R. inopinatum* was raised at Kew from seeds collected by Capt. H. J. Walton at Gyantse in Tibet in September, 1904, during the Tibet Mission, and presented by the Director of the Botanical Survey of India in 1905; it flowered in a herbaceous border in July, 1906. In this open border it has proved an attractive little plant, the grey-green leaves forming an excellent foil to the bright red or crimson inflorescence, which continued at its best for several weeks. Being quite hardy and capable of holding its own by reason of its fleshy rootstock it ought to find favour as a border plant.—D. Prain.

Fig. 1, a flower; 2 and 3, front and back view of anther; 4, pistil; 5, cluster of fruit:—*all enlarged*; 6, entire plant:—*about ⅛ nat. size.*

8191

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TAB. 8191.

OLEARIA CILIATA.

Australia and Tasmania.

COMPOSITAE. Tribe ASTEROIDEAE.

OLEARIA, *Moench.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 276.

Olearia ciliata, *F. Muell. Fragm. Phyt. Austr.* vol. v. p. 79, in syn.; *Benth. Fl. Austral.* vol. iii. p. 488; foliis linearibus ciliatis, pedunculis longiusculis distincta.

Suffrutex dumiformis, 20–30 cm. altus, ramis pluribus suberectis vel ascendentibus plus minusve hirsutis. *Folia* conferta, arcuato-recurva, linearia, inferne longiuscule ciliata, superne sparse minute ciliolata tantum, 1–3 cm. longa, basi 1·5–2·5 mm. lata, apice acuta, marginibus superne revolutis. *Capitula* in ramis solitaria, terminalia, radiis inclusis circiter 2·5 cm. diametro, pedunculis 2–20 cm. longis apice lanato-tomentosis. *Involucrum* anguste campanulatum, in sicco hemisphericum; bracteae lanceolatae usque lineares, 4–8 mm. longae, ciliatae, exteriores interioribus breviores. *Flores* radii feminei, 15–20. *Corollae* lilacinae tubus 3 mm. longus, limbus circiter 1 cm. longus. *Ovarium* pilosum. *Pappus* uniserialis; setae subaequales vel paucis brevissimis interjectis, barbellatae. *Flores* disci hermaphroditi, numerosi, involucrum paullulo excedentes. *Corolla* lutea; tubus 3·5–4 mm. longus; lobi brevissimi. *Antherae* ecaudatae. *Styli appendices* breves, deltoideae.—*Eurybia ciliata*, Benth. in Hueg. Enum. p. 58. *Aster Huegelii*, F. Muell. Fragm. Phyt. Austr. vol. v. p. 79.

Olearia ciliata inhabits deserts and sandy places at various elevations in West Australia, South Australia, Victoria and Tasmania, and seems to be rather polymorphic. It reminds one in habit of an *Aster* or *Felicia* (B. M., t. 8049), genera which are distinguished by critical characters, such as the degree of compression of the achenes and the numbers of rows of pappus-bristles. *Olearia* is confined to Australasia, and *Felicia* to Africa, whilst *Aster* is widely distributed in America, Europe and Asia, with also a few species in South Africa.

DESCRIPTION.—*Shrub*, 1–2 ft. high, with ascending or nearly erect, pubescent branches. *Leaves* crowded, recurved, linear, acute, long-ciliate in the lower third or half, sparsely and very minutely ciliate above, $\frac{1}{2}$–1 in. long, about $\frac{1}{12}$ in.

broad at the base, margins revolute above. *Heads* solitary and terminal on each branch, about 1 in. in diameter including the ray; peduncles 1–8 in. long, woolly-tomentose at their apex. *Involucre* narrowly campanulate; bracts ciliate, the outermost ones lanceolate, about $\frac{1}{6}$ in. long, the innermost ones linear, about $\frac{1}{3}$ in. long. *Ray-flowers* female, 15–20. *Corolla* lilac; tube $\frac{1}{8}$ in. long; limb under $\frac{1}{2}$ in. long. *Ovary* pilose. *Pappus* bristles in a single row, subequal or with one or two much shorter ones in between. *Disk-flowers* hermaphrodite, hardly longer than the involucre. *Corolla* yellow; tube about $\frac{1}{6}$ in. long; lobes very short. *Anthers* not tailed. *Style-appendages* short, deltoid.—T. A. SPRAGUE.

CULTIVATION.—Kew is indebted for this plant to Sergt. Goadby, R.E., Albany, West Australia, who whilst stationed in that State collected specimens and seeds of many interesting plants for Kew. In 1899 he forwarded seeds of this *Olearia*, and a plant flowered in the Temperate House in April last year. It forms a twiggy bush of aster-like appearance, and is quite worthy of a place among cool greenhouse plants. Whether it would thrive in the open air in any part of the British Islands remains to be tested. It is not easy to propagate from cuttings, and it has failed to mature seeds.—W. WATSON.

Fig. 1, a leaf; 2, ray-flower; 3, disk-flower; 4, pappus-bristle; 5, anthers; 6, style-arms:—*all enlarged.*

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CONTENTS OF No. 40, APRIL, 1908.

TAB. 8187.—BULBOPHYLLUM BINNENDIJKII.
,, 8188.—KAEMPFERIA KIRKII, *var.* ELATIOR.
,, 8189.—SAXIFRAGA BRUNONIANA.
,, 8190.—RHEUM INOPINATUM.
,, 8191.—OLEARIA CILIATA.

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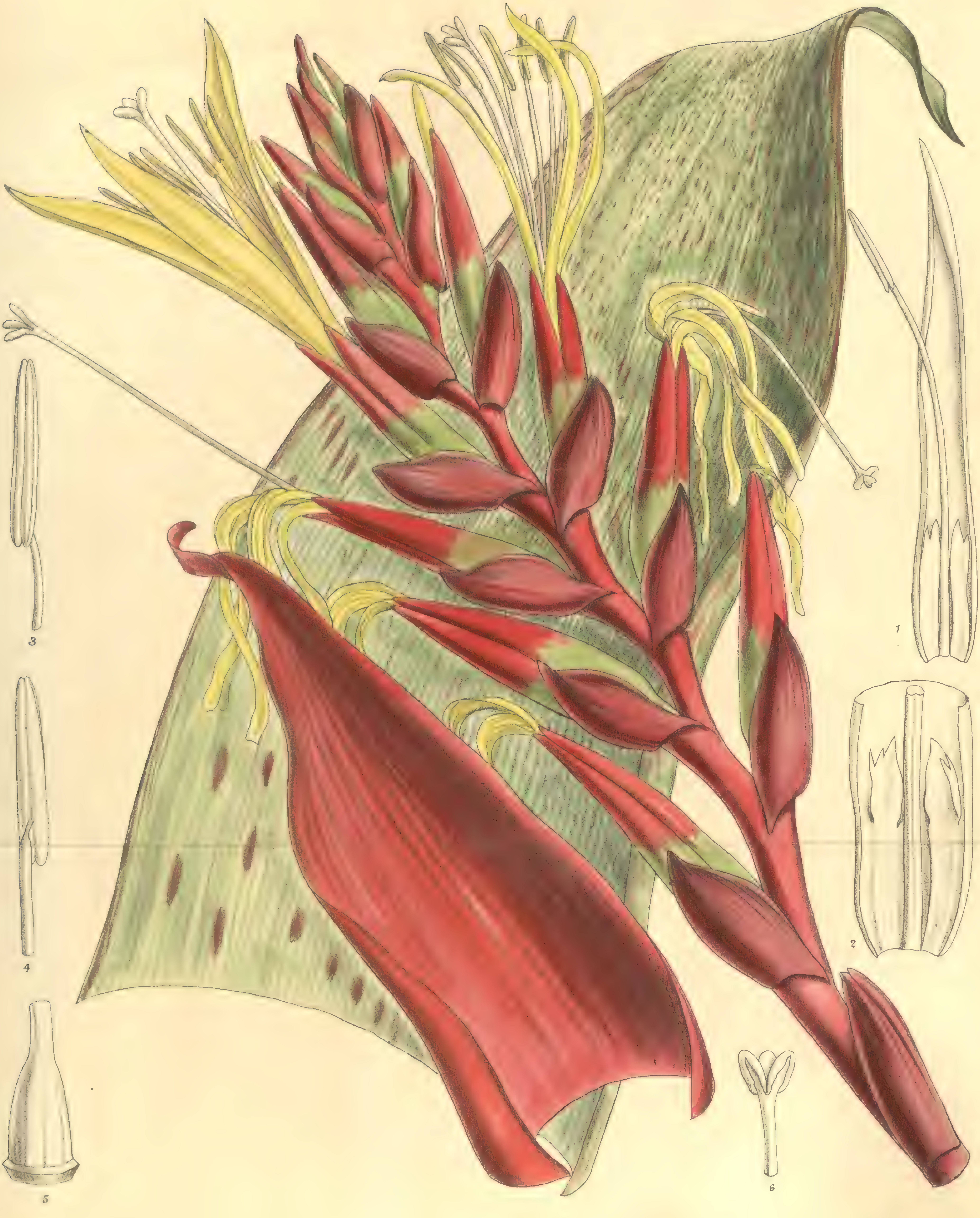

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TAB. 8192.

TILLANDSIA BLOKII.

South America.

BROMELIACEAE.

TILLANDSIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 669; *Mez in DC. Monogr. Phaner.* vol. ix. p. 633.

Tillandsia Blokii, *Hort.*, *Gard. Chron.* 1898, vol. xxiii. p. 254; *Journ. de la Soc. d'Hort. de France*, 1898, vol. xx. p. 479 (nomen tantum); species ex affinitate *T. reginae*, auctorum, a qua differt foliis latioribus rubromaculatis, bracteis sanguineis, floribus minus divergentibus et petalis luteis biligulatis.

Planta perennis, monocarpica, florigera circiter 2 m. alta, caule simplici crasso brevissimo. *Folia* numerosa, densissime rosulata, crassa, coriacea, lineari-oblonga, usque ad 1 m. longa, infra medium circiter 15 cm. lata, apice abrupte longeque acuminata, integra, inermia, recurva, maculis rubropurpureis ornata. *Inflorescentia* terminalis, erecta, pinnatim paniculata, circiter 1·5 m. longa; scapus bracteis amplis coriaceis sanguineis ovato-acuminatis diu persistentibus vestitus; rami laterales circiter 14, quaquaversi, curvati, recurvi, 20–30 cm. longi, flexuosi, sanguinei, usque ad 12-flori. *Bracteae florigerae* ovatae, acutae, quam calyx dimidio breviores, sanguineae, calyci arcte appressae, persistentes. *Flores* distichi, breviter pedicellati, inter se 1·5–2 cm. distantes, circiter 10 cm. longi. *Sepala* 3, lanceolata, 4–5 cm. longa, acuta, sanguinea, coriacea, persistentia, capsulae longiori arcte appressa. *Petala* 3, linearia, circiter 10 cm. longa, acuta, intus basi ligulis binis dentatis instructa, cito marcescentia. *Stamina* 6, petala aequantia. *Stylus* trifidus, stamina vix excedens. *Capsula* (plane matura non visa) 3-locularis, oblonga, 5–6 cm. longa, acuminata, subcarnosa, nitida; loculorum parietibus intus atro-purpureis nitidis. *Semina* numerosissima, cylindrico-clavata, ferruginea, cum cauda terminali demum in pilos dissoluta comiformi circiter 2 cm. longa, basi coma pilorum obversorum ex ovuli integumento dissoluto ornata; rhaphe valida, demum libera.—*Vriesia Blokii*, Hort.

The species of *Tillandsia* (or *Vriesia*) of the group to which *T. Blokii* belongs have been much confused, partly in consequence of authors attempting to identify different species with the very rude, diagrammatic figure of *T. regina*, Vell. (Fl. Flum. Ic. vol. iii. t. 142), partly from the fact that Lemaire figured (Illustr. Hort. vol. xiv. t. 516) one species, the one generally accepted as *T. regina*, and described another, the *Vriesia imperialis*, Morr. (*V. Glazioveana*, Carr. in Rev. Hort. 1881, p. 50, with a coloured plate), partly also from differences of view as to specific limits.

Mr. J. G. Baker (Handbook of the Bromeliaceae, p. 22) included *V. imperialis*, Morr., and *V. geniculata*, Wawra, under *T. regina* (*V. Glazioviana*, Lem. in Ill. Hort. 1867, t. 516); but Mez, with complete specimens before him, restored them to specific rank (DC. Monogr. Phaner. vol. ix. p. 615), and unravelled their very much involved synonymy. *V. imperialis* differs from the others in having secund, not distichous, white flowers, and in stature, sometimes attaining a height of 16 to 18 ft. *T. regina*, as known to us, has distichous, white bracts and flowers, only the lower bracts being tinged with red; and the flowers are given off at nearly right angles to the axis. But there is a drawing in the Morren collection at Kew of a *Tillandsia* having a red scape, green bracts, red inside, a green calyx and yellow petals, which Morren himself named *Vriesia gigantea*, a garden name for *T. regina*.

The history of *T. Blokii* is obscure and its origin apparently unrecorded. A very fine plant of it was exhibited in flower at the Ghent quinquennial meeting in 1898, but the name of the exhibitor is not given in any of the contemporary papers. In the *Gardeners' Chronicle* report we read: "The giant of the family was a huge specimen of *Tillandsia* (*Vriesia*) *regina*, shown as *V. Blokii*. It was as tall as a man and in flower." And practically the same statement appeared in the *Journal de la Société National d'Horticulture de France*. Mr. F. W. Moore, to whom we are indebted for the specimen figured and for photographs of the entire plant, writes: "I purchased the plant in question from l'Horticulture Colonial, Parc Leopold, Brussels, in April, 1903, under the name of *Vriesia Blokii*. It was a healthy little plant, about twelve inches high, and I was given to understand that it was a seedling of the original, shown at Ghent, and quite distinct from *T. regina*. It did not flower with me until last year. The whole plant is about 6 ft. high, and the diameter of the inflorescence from tip to tip of the branches is 2 ft. 3 inches. I think it is a finer plant than *T. regina*, and the large bracts retain their colour through the fruiting stage."

The seeds of many of the Bromeliaceae are very singular and beautiful objects. Those of *Tillandsia Blokii* are exactly like those of *Vriesia imperialis*, Morr., as figured by Mez (Fl. Bras. vol. iii. pars 3, t. 105). They are narrow, cylindrical or clavate bodies, tailed at the distal end and furnished with a reversed coma at the base enveloping the lower half of the seed. When the seed is ripe the tissue of the tail is broken up into hair-like rows of cells similar to the pappus of a composite. The basal coma, in the same manner, is the result of the breaking up of the outer integument or testa of the ovule. The integument breaks up in a variety of ways in different species of the genus. In *T. Regnellii*, Mez (Fl. Bras. t. 110), for example, it breaks up into a reversed coma at each end, the hairs of which overlap each other and completely clothe the body of the seed. Unfortunately we did not receive the seed of *T. Blokii* until after the plate was printed.

DESCRIPTION.—*Shrub*, flowering only once, though of several—sometimes twenty—years' duration. *Stem* very short, unbranched. *Leaves* numerous, densely tufted, thick, leathery, narrow-oblong, 2½–3½ ft. long, about 6 in. across in the widest part above the broad base, tapering upwards, abruptly long-pointed, entire, unarmed, recurved, beset with oblong, purple-red blotches. *Inflorescence* crimson, terminal, erect, pinnately paniculate, 4 ft. 6 in. to 5 ft. long; scape stout, clothed with broad, sheathing bracts; lateral branches about 14, spreading in all directions, recurved, 8 in. to 1 ft. long, ziz-zag, 10–12-flowered. *Floral bracts* ovate, acute, half as long as the calyx, closely appressed, persistent. *Flowers* in two rows, very shortly stalked, ½–¾ in. apart, about 4 in. long. *Sepals* 3, lanceolate, 1¾–2 in. long, acute, leathery, crimson, persistent, closely appressed to the capsule. *Petals* 3, yellow, linear about 4 in. long, acute, furnished with two small, toothed scales near the base on the inside, marcescent. *Stamens* 6, equalling the petals. *Style* shortly 3-lobed, a little longer than the stamens. *Capsule* 3-celled, oblong, 2–2½ in. long, acute, leathery, shining. *Seeds* very numerous, comose at both ends, the basal coma reversed.—W. BOTTING HEMSLEY.

CULTIVATION.—The large *Tillandsiae* are handsome stove plants. Several of them have long been conspicuous objects in the tropical houses at Kew, and one of them, *T. regina*, flowered in the Victoria house last year, where also the gigantic *Brocchinia cordylinoides* flowered about twenty years ago. They require tropical conditions, enjoying plenty of moisture at the root, the healthiest plants at Kew being those that stand on the tank in which the *Victoria regia* is cultivated, their pots being partly in the water. Here they receive full sunshine and as much moisture as they would get in a tropical forest. In the palm house the conditions are too dry for these plants. It is unfortunate that the whole of the upper portion of the plant dies immediately after flowering, but suckers are usually developed from the base of the stem, and these afford means of obtaining fresh stock. Under cultivation it takes these big species of *Tillandsia* about twenty years to reach the flowering stage.—W. WATSON.

Fig. 1, a petal and stamen from the inside; 2, lower part of the same; 3 and 4, front and back views of an anther; 5, ovary; 6, top part of style:—*all enlarged.*

8193

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TAB. 8193.

× PHILADELPHUS PURPUREO-MACULATUS.

Garden origin.

SAXIFRAGACEAE. Tribe HYDRANGEAE.

PHILADELPHUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 642.

Philadelphus purpureo-maculatus, *Lemoine, Catal. Automne*, 1904, n. 158 *J. Veitch & Sons, Catal. Hardy Trees and Shrubs* [1904], p. 144; stirps hybrida origine incerta; × *P. Lemoinei* similis, sed floribus albo-rubris differt; etiamque a *P. mexicano* var. *Coulteri*, Hort. (cujus flores quoque albo-purpurei) foliis floribusque minoribus, petalis ovatis, stylis glabris et stigmatibus capitatis recedit.

Frutex 1–2 m. altus, glabrescens, floribundus, ramis primum rubris gracilibus, primariis elongatis, secundariis lateralibus floriferis brevissimis. *Folia* brevissime petiolata, papyracea, ovata, in ramis floriferis saepius 1–1·5 cm. longa, maxima 2·5–3 cm. longa, apiculata, basi rotundata, integra vel utrinque 1-denticulata, primum pilis appressis parce instructa. *Flores* pulchelli, in ramorum lateralium brevissimorum apicibus saepissime solitarii, 3·5–4 cm. diametro. *Calycis lobi* 4, crassi, ovati, 6–7 mm. longi, apiculato-acuminati, 3-nervi, extus parcissime puberuli, intus albo-tomentosi. *Petala* 4, rotundato-ovata, circiter 1–5 cm. longa, glabra, vel pilis paucissimis extus instructa, alba, basi rubro-purpurea. *Stamina* numerosissima. *Styli* glabri. *Capsula* ignota.—*P. Lemoinei* var. *maculatus*, **Gard. Chron. 1904, vol. xxxvi. p. 14.**

Lemoine states that this remarkable novelty was the issue of *P. Lemoinei* "fantasie"; itself the result of a cross in which *P. Coulteri* was one of the parents. In consequence of there being two, or possibly three, different kinds of *Philadelphus* in cultivation having red and white flowers, considerable research was necessary to establish the identity of the present one, and this brought to light some interesting facts which may be put on record here. It may be premised that the wild forms of *Philadelphus* are very difficult of discrimination, and the cultivated ones still more so in consequence of complicated intercrossing.

P. mexicanus, Schlecht., was described (Linnaea, 1839, vol. xiii. p. 418) from specimens collected by Schiede and others; all having large, semi-double flowers, solitary or in threes. In the same place the author describes his *P. affinis*, from specimens in fruit, in racemes of five. Nothing is said as to the colour of the flowers of the former, so we may assume that they were white. The same year Hartweg collected

MAY, 1908.

specimens which Bentham subsequently referred (Pl. Hartw. p. 61) to *P. mexicanus.* Judging from the dried specimens, the petals had a large, dark spot or centre. Hartweg also introduced a *Philadelphus* with wholly white flowers from Mexico, which Lindley figured (Bot. Reg. vol. xxviii. t. 38*) as *P. mexicanus*; see also B. M. t. 7600. In 1887–8, S. Watson described (Proc. Am. Acad. vol. xxii. p. 472; Garden and Forest, vol. i. p. 232, f. 40) *P. Coulteri* as differing from *P. mexicanus* in its dense pubescence, non-acuminate leaves, and the hairy summit of the ovary. The flowers are described as very fragrant and an inch or more across; but the colour is not given. Writing from Dublin in 1891, the late F. W. Burbidge sent a *Philadelphus* to Kew, with the following note: "Can you kindly give me the name of the enclosed? I cannot find it in the books. It exists in one or two old gardens here, where it is called Rose Syringa. Its sweet fragrance and purple-centred flowers are remarkable." Returning to the subject in 1903 (Gard. Chron. vol. xxxiv. p. 218), Burbidge says: "There is a variety of *P. mexicanus*, called *P. m. Coulteri*, introduced, it is said in Nicholson's Supplement, as recently as 1888; but probably this is a mistake, as the shrub has existed for many years in old Irish gardens. . . . . It rarely flowers except during or after very hot summers, and it differs from all other species or varieties of *Philadelphus* inasmuch as each of its four white petals has a purplish blotch at its base which contrasts well with the central tuft of yellow stamens." Commenting on this, Schneider (Illustriertes Handbuch der Laubholzkunde, 1906, vol. i. p. 363) states: "There is yet another kind in which the petals have a red eye at the base. The shrub is of unknown origin, and was to be found in the Botanic Garden at Leipzig, where I saw it in June, 1904. Prof. Koehne wrote me that this obscure variety, which he had provisionally named *P. maculiflorus*, was quite different from *P. Coulteri*." In answer to our inquiry, Prof. Koehne replied that he could not decide from the imperfect specimen sent whether *P. purpureo-maculatus* was the same as his *P. maculiflorus.*

How, when, or by whom, the name *Coulteri* was given to what we may call the Irish *Philadelphus*, we have not been able to ascertain; but it is the same as Hartweg's specimens referred to above, and apparently different, as to the colour of the flowers, which Nicholson describes as white, from typical *Coulteri*. Mr. W. E. Gumbleton, who grows them side by side, informs us that *Coulteri* differs only in the colour of the flowers from the form commonly cultivated under the name of *mexicanus*. Neither Koehne nor Schneider was clear as to the identity of *P. Coulteri*.

DESCRIPTION.—*Shrub*, 3–6 ft. high, glabrescent, very free-flowering. *Branches* slender, red when young, primaries elongated, secondaries lateral, very short, usually 1-flowered. *Leaves* very shortly stalked, papery, ovate, $\frac{1}{3}$–$\frac{2}{3}$ in. long on the flowering branches, larger on the leafy shoots, apiculate, rounded at the base, entire or furnished with one tooth on each side, at first sparsely furnished with appressed hairs. *Flowers* solitary, terminal on very short lateral shoots of the main, long branches. *Calyx lobes* 4, ovate, about $\frac{1}{4}$ in. long, acuminate, 3-nerved, puberulous outside, tomentose inside, white. *Petals* 4, ovate-rotundate, $\frac{1}{2}$–$\frac{2}{3}$ in. long, glabrous or furnished with a few scattered hairs on the outside, white with a bright purple-red base. *Stamens* very numerous; anthers yellow. *Styles* and top of ovary glabrous; stigmas capitate.—W. BOTTING HEMSLEY.

CULTIVATION.—The plant here figured is a very distinct addition to the hardy sorts of *Philadelphus*. The fine purple blotch which stains the base of each petal gives a colour effect which is lacking in the other hardy species, all of which have pure or nearly pure white flowers. Judging by the young plants in the Kew collection it appears to be of low or medium habit. A mode of cultivation which answers exceedingly well for *Philadelphus Lemoinei* at Kew may be adopted for this plant also. This is to cut away the shoots that have flowered as soon as the blossoms are over, thus leaving behind nothing but the young growths of the current year. These grow quickly and make long flowering shoots for the following year, to be cut away in their turn. Propagation is most readily effected by cuttings made of the young shoots whilst they are still in a semi-herbaceous condition. Placed in a brisk bottom-heat they strike root in a few days. The plant from which the figure was prepared was purchased from Messrs. Veitch in 1905.—W. J. BEAN.

Fig. 1, a leaf; 2, calyx and pistil; 3 and 4, stamens:—*all enlarged.*

8194

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TAB. 8194.

PUYA VIOLACEA.

Chile.

BROMELIACEAE.

PUYA, *Molina*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 666; *Mez in DC. Monogr. Phaner.* vol. ix. p. 466.

Puya violacea, *Mez in DC. Monogr. Phaner.* vol. ix. p. 476; species *P. caeruleae*, Lindl. (Bot. Reg. vol. xxvi. t. 11) valde affinis, differt bracteis floralibus multo minoribus integris et floribus minoribus.

Planta perennis, florigera circiter metralis, caule pauciramoso brevi. *Folia* numerosa, conferta, rigida, linearia, maxima vix 0·5 m. longa, longissime filiformi-acuminata, margine aculeis inter se 1–2 cm. distantibus sursum spectantibus armata, striata, dorso minute obscurissimeque lepidota, lepidibus stellatis. *Inflorescentia* terminalis, erecta, pinnatim paniculata, 45–50 cm. alta; scapus graciliusculus, bracteis linearibus 3–4 cm. longis acutis marcescentibus fuscis per totam fere longitudinem vestitus; rami laterales circiter 12, quaquaversi, patentes vel deflexi, 15–20 cm. longi, usque 25-flori. *Bracteae florigerae* ut in scapo, calyce breviores, glabrae vel glabrescentes. *Flores* spiraliter dispositi, breviter pedicellati, inter se demum 0·5–1 cm. distantes, circiter 6 cm. longi. *Sepala* 3, viridia, lanceolata, circiter 3 cm. longa, acuta, persistentia. *Petala* 3, violacea, oblongo-spathulata, circiter 6 cm. longa, apice obtusa, breviter recurva, intus basi 2-squamata. *Stamina* 6, petala subaequantia, antheris luteis vel aurantiacis. *Stylus* inclusus. *Capsula* "perfecta ellipsoidea, circiter 1–5 cm. longa, nitida, apice obtusa, et septicide et loculicide in partes 6 dehiscens. *Semina* 3 mm. longa, cuneiformia, dorso apiceque anguste alata" (Mez).—*Pitcairnia violacea*, Brongn. in Ann. Fl. et Pomon. 1847, vol. i. p. 116, cum fig.; Baker, Brom. p. 118. *Pourretia violacea*, Linden Cat. 1853, n. 8, p. 31. *Puya paniculata*, Philippi, in Linnaea, vol. xxiii. p. 247. *Pitcairnia Philippii*, Baker, Brom. p. 122.

The Annales de Flore et de Pomone, in which *Puya* (*Pitcairnia*) *violacea* was first published, are not in the Kew library, but from an extract from the same in Otto and Dietrich's Allgemeine Gartenzeitung, 1847, vol. xv. p. 299, it appears that *Puya violacea* was first raised from seed in the Jardin des Plantes, Paris, in 1833 and flowered for the first time at Neuilly in 1847, a long time to wait for flowers, though they are brilliant when they do appear. But many Bromeliaceae flower only once or at distant intervals. The conflicting views of different writers on some of the genera of the Bromeliaceae are somewhat puzzling. Bentham and Hooker retain *Pitcairnia*, *Puya* (including *Pourretia*) and

Tillandsia (including *Vriesia*). Baker's limitations are much the same; but Mez keeps up both *Tillandsia* and *Vriesia*; the latter having free petals; the former connate or closely conglutinated petals. Apart from this, a very large proportion of the Bromeliaceae in cultivation have names under at least two genera.

Mez has also revised the synonymy of som , of the allied species of *Puya*. Lindley adopted the name *caerulea* for the plant he figured and described in the place cited above, believing it to be the same as that mentioned in Miers's Travels in Chile and La Plata, vol. ii. p. 531, as *Pourretia caerulea*; but Mez refers the latter to *Pitcairnia alpestris*, Poepp., to which he also refers *Puya Whytei*, Hook. f. B. M. t. 5732. *Pourretia rubricaulis*, Miers, Travels, p. 531, he regards as the same as *Pitcairnia caerulea*, Lindl.

He distinguishes *Puya*, Molina (including *Pourretia*, Ruiz and Pavon), from *Pitcairnia*, L'heritier, by the completely superior ovary, and he divides *Puya* into three subgenera: *Eupuya*, *Pitcairniopsis* and *Pourretia*.

DESCRIPTION.—*Shrub*, flowering more than once, including inflorescence about 3 ft. high. *Stem* short; branches few. *Leaves* numerous, crowded, stiff, linear, largest 20 in. long, tapering upwards and very narrow, margin furnished with small prickles, ½–¾ in. apart and directed upwards, finely striated, underside clothed with microscopic stellate scales. *Inflorescence* terminal, erect; pinnately paniculate, 18–20 in. high; scape rather slender, clothed with brown linear bracts 1–2 in. long, which shrivel and persist; lateral branches about twelve, spreading in all directions, deflected, 5–8 in. long, 20–25-flowered. *Flowers* spirally arranged, shortly stalked, ¼–½ in. apart. *Sepals* 3, green, lanceolate, 1–1¼ in. long, acute, persistent. *Petals* 3, deep violet, oblong-spathulate, about 2¼ in. long, obtuse, shortly recurved, furnished with two scales inside near the base. *Stamens* 6, nearly equalling the petals; anthers orange. *Style* included.—W. BOTTING HEMSLEY.

CULTIVATION.—*Puya* and that section of *Pitcairnia* which Mr. Baker separated under the name of *Puyopsis* are all hard prickly-leaved plants which appear to be happiest when cultivated under the same condition as *Cacti*, *Agave*, etc. They do not suffer if kept dry at the root, and the poorer the soil the healthier they are; but they must be in a position where they can get plenty of sunlight and air. The handsomest of them is *P. caerulea*, which has flowered several times at Kew. Between this and *P. violacea* there is a close resemblance, but the flowers of the latter are smaller. The latter flowered on the rockery at the south end of the Mexican House in June last year, where it has stood since the house was built, in 1897. The plant was presented to Kew in 1879 by the late Mr. J. Anderson Henry, Hay Lodge, Trinity, Edinburgh, who had it under the name of *Puya paniculata*.—W. WATSON.

Fig. 1, a petal and a stamen; 2, a pistil—*both enlarged*; 3, whole plant:—*about ⅛ nat. size.*

8195

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TAB. 8195.

LIPARIS TABULARIS.

Penang.

ORCHIDACEAE. Tribe EPIDENDREAE.

LIPARIS, *L. C. Rich.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 495; *Ridl. in Journ. Linn. Soc.* vol. xx. p. 244.

Liparis tabularis, *Rolfe in Kew Bulletin*, 1908, p. 68; species insignis, a *L. macrantha*, Rolfe, labello orbiculari obtuso et venis regulariter flabellatis differt.

Pseudobulbi anguste conici, 8–12 cm. longi, circa 2 cm. lati, vaginis membranaceis albidis venosis imbricatis tecti. *Folia* membranacea, ovato-elliptica, breviter acuminata, undulata, plicata, 9–14 cm. longa, 4–5 cm. lata; petioli dilatati, in vaginis imbricatis spathaceo-oblongis acutis carinatis et striatis inclusi. *Scapus* erectus, acute 5-angulatus, purpureus, circa 15 cm. altus; racemus laxus. *Bracteae* triangulari-subulatae, acutae, 2 mm. longae. *Pedicelli* angulati, purpurei, 1·5 cm. longi. *Flores* magni, purpurei. *Sepalum posticum* oblongo-lanceolatum, acutum, 1·5 cm. longum; sepala lateralia oblonga, acuta, circa 1·2 cm. longa, marginibus revolutis. *Petala* filiformia, 1·5 cm. longa. *Labellum* orbiculare, crebre denticulatum, leviter recurvum, 1·5–2 cm. latum, ima basi callosum. *Columna* clavata, incurva, 8 mm. longa.

The genus *Liparis* is not often met with outside Botanic Gardens, as few of the species can be called showy. There are, however, a few exceptions, and among them the subject of the present plate. *L. tabularis* flowered in the collection of Mr. H. T. Pitt, Rosslyn, Stamford Hill, in April, 1906, and was exhibited at a meeting of the Royal Horticultural Society. Shortly afterwards a plant was presented to Kew, where it flowered in the following June, when the annexed drawing was made. After some correspondence it was ascertained that it had been sent by Mr. C. Curtis, of the Forest Department, Penang, to Mr. H. A. Tracy, of Twickenham, so that it is probably a native of the region mentioned. It is most nearly related to the Formosan *L. macrantha*, Rolfe, from which, however, it differs in having an orbicular lip, with regularly radiating veins. Its large reddish purple flowers with strongly denticulate lip render it very attractive.

Liparis is a large and widely diffused genus, being found throughout the tropics, and in subtropical, and even temperate regions; a single species, *L. Loeselii*, Rich., being represented in a few British localities. The species are most numerous in the mountains of India and the Malayan Archipelago. Four other species have been figured in this work, namely:—*L. tricallosa*, Reichb. f. (t. 7804), a large-flowered Malayan species, closely striped with purple on the lip; *L. atropurpurea*, Wight (t. 5529), a native of South India, having dark purple flowers; *L. Walkeriae*, Graham (t. 3770), a Ceylon species with small green and purple flowers; and *L. foliosa*, Lindl. (t. 2709), a species with small green flowers, now known to be a form of the Australian *L. reflexa*, Lindl.

DESCRIPTION.—*Pseudobulbs* narrowly conical, 3–5 in. long, about ¾ in. broad, covered with white membranous veined imbricating sheaths. *Leaves* membranous, ovate-elliptical, shortly acuminate, undulate, plicate, 3–5½ in. long, nearly 2 in. broad; petioles broad, included within the basal imbricating sheaths. *Scape* erect, about 6 in. high, acutely 5-angled, purple; raceme lax, many-flowered. *Bracts* triangular-subulate, acute, ⅙ in. long. *Pedicels* angled, purple, about ½ in. long. *Flowers* large, reddish purple. *Dorsal sepal* oblong-lanceolate, acute, over ½ in. long; lateral sepals oblong, acute, rather shorter and broader than the dorsal, revolute at the margins. *Petals* filiform, over ½ in. long. *Lip* orbicular, closely denticulate, slightly recurved, about ¾ in. broad, with a thickened callus at the base. *Column* clavate, incurved, nearly ½ in. long.—R. A. ROLFE.

Fig. 1, lateral petals and base of lip, with column; 2, anther cap; 3, pollinia:—*all enlarged.*

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TAB. 8196.

PRUNUS TOMENTOSA.

China.

ROSACEAE. Tribe PRUNEAE.

PRUNUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 609.

Prunus tomentosa, *Thunb. Fl. Jap.* p. 203; *Schneider, Laubholzk.* vol. i. p. 601; affinis *P. Jacquemontii*, Hook. f., sed foliis ramisque novellis tomentosis, sepalis utrinque glabris et petalis plerumque albis distincta.

Frutex dense divaricato-ramosus, cultus vix ultra 1·5 m., spontaneus ad 3 m. altus; rami virgati, novelli fulvo-tomentelli, deinde glabrescentes, tandem cortice saturate castaneo tecti. *Gemmae* foliiparae ovatae, acutae, brunneae. *Folia* elliptica vel obovata, breviter subito acuminata, basi obtusa, serrato-crenata, ad 7 cm. longa, ad 4 cm. lata, supra sparse pilosa, saturate viridia, subtus cinereo- vel fulvo-tomentosa, nervis lateralibus utrinque 5–7, obliquis; petiolus 4–5 mm. longus, tomentellus; stipulae filiformi-subulatae, ad basin bifidae, glanduloso-fimbriatae, ad 8 mm. longae. *Flores* e gemmis unifloris in brachycladiis brevissimis cum foliis fasciculati; gemmae solitariae vel saepius geminatae vel in planta spontanea plures, perulis brunneis ovato-rotundatis ciliolatis caeterum glabris vel subglabris; pedicelli tomentelli, demum 3–4 mm. longi. *Receptaculum* breviter tubulosum, superne paullo latius, extus glabrum, intus ad filamentorum insertionem pilosulum. *Sepala* late ovata, subacuta vel obtusa, herbacea, 1·5 mm. longa, utrinque glabra. *Petala* alba vel roseo-suffusa, late obovata, unguiculata, circa 8 mm. longa. *Stamina* circa 25. *Ovarium* apice pilosulum. *Drupa* cerasum parvum ellipsoideo-globosum referens, 12 mm. longa, rubra, sparse pilosula; putamen ad 7 mm. longum.—*P. trichocarpum*, Bunge in Mem. Sav. Etr. Petersb. vol. ii. (1835), p. 96.

The home of this dwarf cherry is in the mountains of Northern and Western China, from Mandshuria to Szechuen. According to Bretschneider it is much cultivated at Peking for its edible, cherry-like fruits. It became, however, first known from Japan, where it is also frequently grown in gardens. Specimens of it were collected by Moorcroft in Ladakh and by T. Thomson in the valley of Kashmir. The former was named *Cerasus tomentosa* by Wallich in his Catalogue. It is very probable that those specimens were also taken from cultivated plants.

DESCRIPTION.—*Shrub*, divaricately branched, dense, 4–5 ft. high or, in the wild state, as much as 9 ft. high; young branches fulvous-tomentose, at length more or less glabrescent; bark deep chestnut brown. *Leafbuds* ovoid,

MAY, 1908.

acute, brown. *Leaves* elliptic or obovate, shortly and suddenly acuminate, obtuse at the base, serrate-crenate, the largest almost 3 in. long and 1½ in. broad, sparingly hairy on the upper side, greyish- or fulvous-tomentose below, with 5–7 oblique lateral nerves on each side; petiole $\frac{1}{6}$ in. long; stipules filiform-subulate, bifid almost to the base, glandular-fimbriate, $\frac{1}{3}$ in. long. *Flowers* from one-flowered buds, 1 or 2, rarely more, fascicled with the young leaves on very much shortened branches; bud scales ovate-rotundate, brown, ciliolate. *Pedicels* tomentose, up to $\frac{1}{6}$ in. long. *Receptacle* short, tubular, slightly widened above, glabrous without, hairy within at the insertion of the stamens. *Sepals* herbaceous, broad-ovate, subacute or obtuse, glabrous on both sides. *Petals* white or tinged with pink, broad-ovate, clawed, about $\frac{1}{3}$ in. long. *Stamens* about 25. *Ovary* hairy in the upper part. *Fruit* a small, sparingly hairy cherry, ½ in. long, bright red.—OTTO STAPF.

CULTIVATION.—*Prunus tomentosa* is one of the earliest-flowering species of its genus. It is usually in full blossom during March, and is one of the most attractive of hardy shrubs at that season. The species is not common in gardens, but is well worth cultivating for its early flowers and its neat habit. It makes a low, rounded, dense bush, somewhat wider than it is high. Its only defect as a garden shrub is that its beauty is rather fleeting. The petals are fragile and unable to withstand the pelting showers which frequently prevail in late March and early April. The plants at Kew occasionally ripen a few fruits, but these are too infrequent to afford a reliable means of increase. The species can, however, be propagated by means of cuttings. The plant from which our figure was made has long been in the collection at Kew.—W. J. BEAN.

Fig. 1, a young leaf; 2, a stipule; 3, receptacle and calyx laid open to show the pistil; 4, ovary :—*all enlarged.*

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BOTANICAL MAGAZINE.

CONTENTS OF No. 41, MAY, 1908.

Tab. 8192.—TILLANDSIA BLOKII.
„ 8193.—× PHILADELPHUS PURPUREO-MACULATUS
„ 8194.—PUYA VIOLACEA.
„ 8195.—LIPARIS TABULARIS.
„ 8196.—PRUNUS TOMENTOSA.

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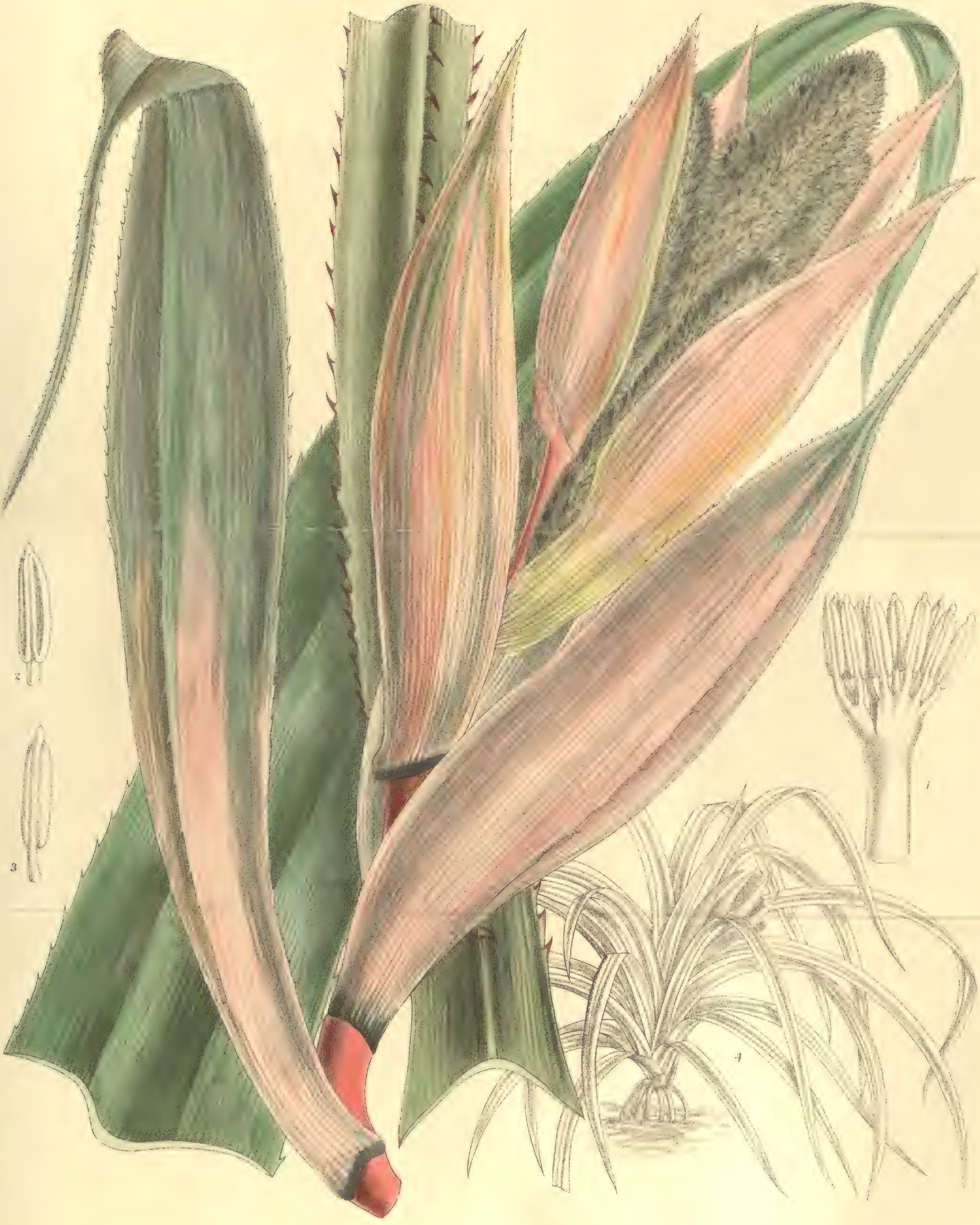

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TAB. 8197.

PANDANUS HOULLETII.

Singapore.

PANDANACEAE.

PANDANUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 949.

Pandanus Houlletii, *Carr. in Rev. Hort.* 1868, p. 210, fig. 23; *Ridley, Mat. Fl. Mal. Penins.* ii. p. 224; inter species sectionis *Ryckiae* syncarpio solitario cylindrico pedali distinctus.

Truncus (in planta spontanea) 2–2·5 m. altus, simplex vel basi tantum divisus, 10 cm. diametro, radicibus aëriis 5 cm. crassis. *Foliorum bases* persistentes; laminae lineares, sensim longe in acumen tenue ad 15 cm. longum attenuatae, ad 2·5 m. longae, 10 cm. latae, coriaceae, saturate virides, saepe cupreo-purpurascentes vel juniores purpureae, spinis marginalibus parvis curvatis apice purpureis vel fuscis 1 cm. distantibus. *Paniculae masculae* ad 1 m. longae; bracteae inferiores late lanceolatae, acuminatae, in margine spinulosae, 30 cm. longae, 7·5 cm. latae, summae 15 cm. longae, 2·5 cm. latae; spicae densae, cylindricae, 15–20 cm. longae, 1·8 cm. diametro. *Staminum filamenta* fere at apices in columnam 6 mm. crassam connata; antherae 2 mm. longae, apiculatae, tota longitudine dehiscentes. *Spica femina* solitaria, matura cylindrica, 30 cm. longa, aurantiaca, carnosa. *Drupae* angulatae, 12 mm. diametro, vertice truncato plano.—*P. Houlletianus*, Ridley, l.c. p. 222.

This fine screw pine was introduced from Singapore by a Mr. Porte in 1865, and flowered in the Jardin des Plantes in Paris for the first time in 1868. It was a male plant, like the Kew specimen from which the accompanying figure was drawn. According to Mr. Ridley, who gave a complete description of it in the wild state, it is endemic in the Southern part of the Malay Peninsula (Singapore and Johore), where it grows in dense forests. The fruit is according to him eatable and tastes like a pineapple.

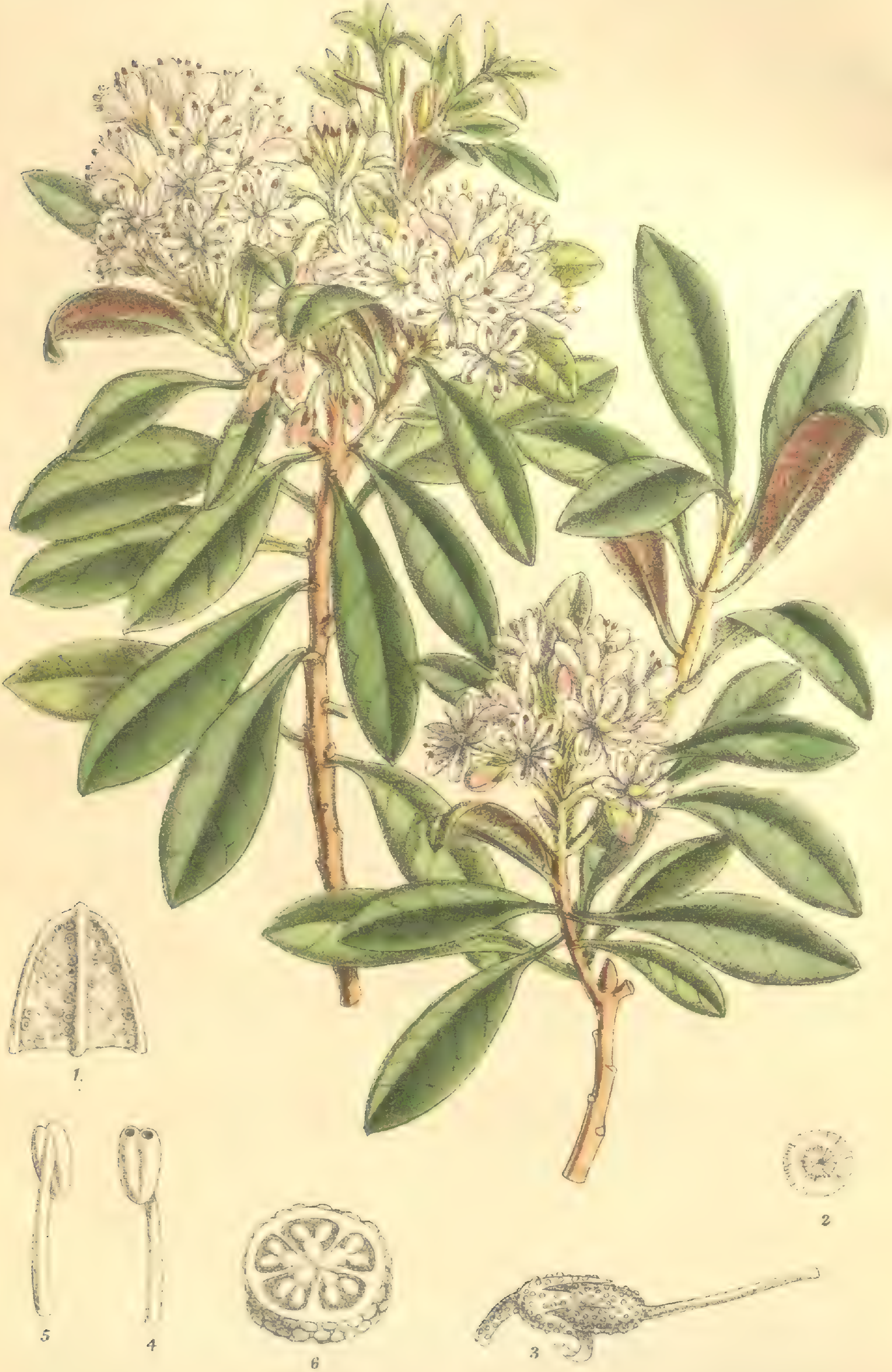
DESCRIPTION.—*Stem* 7 or 8 ft. high in the wild state, simple or at least not branched at the top, 4 in. across; aërial roots 2 in. thick. *Leaves* numerous, their bases persistent; blades linear, gradually tapering into a long slender acumen, sometimes 8 ft. long and 4 in. broad, coriaceous, dark green, tinged with copper-red or the young ones purple, marginal spines small, curved, with brown or

JUNE, 1908.

purple tips. *Male panicle* 2 or more feet long; bracts lanceolate, acuminate, the lower 14 by 3 in., the uppermost 6 in. by 1 in., margins spinulous; spikes cylindric, dense, 6–8 in. long, $\frac{3}{4}$ in. in diameter. *Filaments* united almost to their tips into columnar fascicles, $\frac{1}{4}$ in. thick; anthers $\frac{1}{12}$ in. long, apiculate, dehiscing all along. *Female spike* solitary; in fruit cylindric, 1 ft. long, orange-coloured, fleshy. *Drupes* angular, $\frac{1}{2}$ in. across, with a truncate, flat top.—OTTO STAPF.

CULTIVATION.—The plant figured was received at Kew in 1905 from the Botanic Gardens, Singapore. It was evidently a seedling. It grew very rapidly under tropical treatment, as all the *Pandani* do, and flowered in April last year. The Kew collection of *Pandani* is rich in species, and some of them flower fairly regularly. In the Palm-house they grow to a large size, with stems as much as 20 ft. high, bearing enormous crowns of leaves. They are easily kept in health, enjoying great heat and plenty of water, whilst they are not particular in regard to soil. In a wild state they grow most luxuriantly in swamps or by the side of rivers, and they are equally happy when treated as sub-aquatics under cultivation. There is a fine collection of them in the Botanical Garden at Brussels, where they are grown in the same tank as the *Victoria regia*. Some of the species are grown as pot plants for decorative purposes, particularly *P. Veitchii*, *P. Sanderi*, *P. inermis* and *P. utilis*. Owing to their being dioecious they have never ripened fruits at Kew, but they are easily multiplied by means of offsets which are freely developed by many of the species, and they strike root readily.—W. WATSON.

Fig. 1, fascicle of stamens; 2 and 3, anthers; 4, a whole plant:—1–3 *enlarged*, 4 *reduced*.



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TAB. 8198.

RHODODENDRON MICRANTHUM.

Northern China and Manchuria.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (§ Graveolentes) **micranthum,** *Turcz. in Bull. Soc. Nat. Mosc.* 1837, no. 7, p. 155; *Fl. Baic.-Dah.* vol. ii. 2, p. 208; *Maxim. Rhod. As. Or.* p. 18; *Forbes et Hemsley in Journ. Linn. Soc.* vol. xxvi. p. 27; species ex affinitate *R. parvifolii*, Adams, a qua floribus racemosis et longissime pedicellatis differt.

Frutex parvus. *Rami* juniores pubescentes, sparse lepidoti, vetustiores glabri. *Folia* biennia, breviter petiolata, oblanceolata, obtusa vel subacuta, basi cuneata, superne glabra, nigro-punctata, subtus densissime lepidota, 3–5 cm. longa, 0·5–1 cm. lata; petioli 3–5 mm. longi. *Racemi* terminales, multiflori; pedicelli 1–1·5 cm. longi. *Calyx* persistens, extra lepidotus; tubus 5 mm. longus; lobi lineares, acuti, ciliati, 2 mm. longi, 0·5 mm. lati. *Corolla* rotato-campanulata, lactea, extra lepidota; tubus 2 mm. longus; lobi oblongi vel subrotundi, obtusi, 4 mm. longi, 3 mm. lati. *Stamina* exserta; filamenta cylindrica, glabra, basi parum dilatata; antherae dorsifixae. *Ovarium* 5-loculare; stylus elongatus. *Capsula* oblonga, elongata, ab apice dehiscens, 6 mm. longa, 2 mm. diam.

Turczaninow, in his original description of this species, describes the inflorescence as being in lateral corymbs, and when correcting himself, Flora Baic.-Dah., says, "racemi . . . axillares, multiflori." The racemes are however distinctly terminal, as stated by Maximowicz in his classification of the Oriental Rhododendrons.

In distribution the species extends from Manchuria in the north, to Kansuh in the west, and Hupeh in the south, but it is only rarely met with, and is noted by all the collectors as being found only on the very tops of the mountains. In its native habitat, Franchet states that it flowers in June and July.

DESCRIPTION.—*Shrub* of small dimensions. *Branches* pubescent and sparingly glandular-scaly when young, glabrous when old. *Leaves* oblanceolate, obtuse to subacute, cuneate at the base, glabrous and pitted above, densely scaly below, 1–2 in. long, $\frac{3}{10}$–$\frac{1}{2}$ in. broad; petioles about

$\frac{1}{8}$ in. long. *Racemes* terminal, many-flowered; pedicels $\frac{1}{2}$ in. long. *Calyx* persistent, scaly, $\frac{1}{10}$–$\frac{1}{8}$ in. long; lobes linear, acute, ciliate. *Corolla* rotate-campanulate, milky white, scaly without, $\frac{1}{4}$ in. long; lobes subrotund. *Stamens* exserted; filaments cylindrical, glabrous, slightly dilated towards the base. *Ovary* 5-celled, style elongated. *Capsule* oblong, elongate, dehiscing from the apex, $\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad.—T. F. CHIPP.

CULTIVATION.—The plant figured was grown in the garden of J. C. Williams, Esq., Caerhays Castle, Gorran, Cornwall, a most enthusiastic collector and cultivator of *Rhododendra*, and was presented to Kew through Messrs. James Veitch & Sons, by whom it was introduced into cultivation through their collector, Mr. Wilson. He described it as a bush from 4 to 8 ft. high, with white flowers, growing at from 5,500 to 8,000 ft. At Coombe Wood this plant has proved hardy, and Mr. Harrow, Messrs. Veitch & Sons' manager there, says it appears to prefer a rather shaded position and a light loam rather than peat. It is, he says, very free-flowering, small plants of it being now covered with flower buds. The plant first flowered at Coombe Wood in May, 1904. In Mr. Williams's garden also the flowers were developed in May.—W. WATSON.

Fig. 1, portion of under surface of leaf; 2, a scale from the same; 3, calyx and pistil; 4 and 5, stamens; 6, cross section of an ovary:—*all enlarged*.

8199

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TAB. 8199.

BULBOPHYLLUM FASCINATOR.

Annam.

ORCHIDACEAE. Tribe EPIDENDREAE.

BULBOPHYLLUM, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 501.

Bulbophyllum fascinator, Rolfe; a *B. appendiculato*, Rolfe, floribus multo majoribus, segmentorum appendicibus linearibus non foliaceis differt.

Herba epiphytica. *Rhizoma* repens, validum. *Pseudobulbi* ovoideo-oblongi, obscure tetragoni, nitidi, 1·5–2·5 cm. longi, monophylli. *Folia* sessilia, coriacea, elliptico-oblonga, obtusa, 5 cm. longa, 1·5–3 cm. lata. *Scapi* patentes, circa 10 cm. longi, uniflori. *Bracteae* spathaceae, apice acuteae, 1 cm. longae. *Flores* magni, pallide virides, purpureo-punctati et ornati. *Sepalum posticum* ovatum, acuminatum, 2·5–3 cm. longum, supra medium ciliatum et appendicibus filiformibus amethystino-purpureis ornatum; sepala lateralia connata, oblongo-lanceolata, longissime caudato-acuminata, 13–18 cm. longa, basi coriacea, crebre verrucosa, marginibus revolutis. *Petala* falcato-oblonga, subacuta, circa 2 cm. longa, margine et apice appendicibus filiformibus amethystino-purpureis ornata. *Labellum* recurvum, ovato-oblongum, subobtusum, canaliculatum, bicarinatum, carinis et marginibus puberulis. *Columna* lata, 8 mm. longa, marginibus acutis, dentibus subulatis, basi obscure tridenticulatis.—*Cirrhopetalum fascinator*, Rolfe in Kew Bulletin, 1908, p. 69.

The remarkable species here figured is a native of Annam, where it was discovered by Mr. W. Micholitz, when collecting for Messrs. Sander & Sons. Living plants were sent home, one of which flowered at Kew in September, 1907, when the species was described under the name of *Cirrhopetalum fascinator*, Rolfe. The genus *Cirrhopetalum*, however, merges so imperceptibly into *Bulbophyllum* that the two are now regarded as indistinguishable, hence the adoption here of the older generic name. *Bulbophyllum fascinator* is nearly allied to the Himalayan *B. appendiculatum*, Rolfe (*Cirrhopetalum ornatissimum*, King & Pantl. in Ann. R. Bot. Gard. Calc. vol. viii. p. 95, t. 133, not of Reichb. f.), but has much larger flowers, with various structural differences. It is a member of a small group characterised by its solitary-flowered scapes, containing the following additional species:—*Bulbophyllum merguense*, Par. & Reichb. f., *B. lasioglossum*, Par. & Reichb. f., *B. antenniferum*,

Reichb. f., *B. maxillare*, Reichb. f., *B. breviscapum*, Ridl. (*Cirrhopetalum breviscapum*, Rolfe, Bot. Mag. t. 8033), and two or three imperfectly known Malayan species. All of these were formerly considered to be anomalous species of *Cirrhopetalum*, having the floral structure though not the remarkable umbellate inflorescence of the genus. The elongation of, and frequently the union of the lateral sepals constituted the most marked character of *Cirrhopetalum*, and it is unfortunate that the occurrence of species of intermediate character should render it untenable.

DESCRIPTION.—*Epiphyte* with stout creeping rhizome. *Pseudobulbs* approximate, ovoid-oblong, obscurely tetragonous, shining, $\frac{3}{4}$–1 in. long, 1-leaved. *Leaves* sessile, elliptical-oblong, obtuse, coriaceous, about 2 in. long, over 1 in. broad. *Scape* suberect, about 4 in. long, 1-flowered. *Bracts* spathaceous, acute, $\frac{1}{3}$ in. long. *Flowers* large, pale green with crimson markings. *Dorsal sepal* ovate, acuminate, about 1$\frac{1}{4}$ in. long, with crimson filiform appendages above the apex, ciliate towards the base; lateral sepals united, oblong-lanceolate below, then prolonged into long caudate appendages, about 7 in. long, the basal part coriaceous, verrucose, with revolute margin. *Petals* falcate-oblong, subacute, under $\frac{1}{2}$ in. long, the margin and apex bearing numerous crimson filiform appendages. *Lip* recurved, ovate-oblong, subobtuse, channelled, bicarinate, with the keels and margins puberulous. *Column* broad, $\frac{1}{3}$ in. long, with acute margins and acute slightly tridenticulate teeth.—R. A. ROLFE.

CULTIVATION.—This is one of the many introductions for which we are indebted to Messrs. Sander & Sons, St. Albans, who presented a plant of it to Kew in 1905, which flowered for the first time in September, 1907. The genus *Bulbophyllum* is popular with orchid fanciers in this country, owing no doubt to the quaintness of form and beautiful coloration in the flowers of many of the species. They are tropical or subtropical, and with few exceptions they enjoy the conditions of a moist stove all the year round with plenty of water about their roots whilst growth is being made and very little during their resting season, generally the winter.

They may be grown either in shallow teak baskets suspended near the roof-glass in a shaded house or on blocks of tree fern stem, and what little compost they require about their roots should be sphagnum moss and peat fibre.—W. WATSON.

Fig. 1, flower, with sepals and petals removed; 2, fringe of sepals; 3, anther-cap; 4 and 5, pollinia, seen from side and front:—*all enlarged.*

8200

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TAB. 8200.

CHIRITA BARBATA.

India.

GESNERACEAE. Tribe CYRTANDREAE.

CHIRITA, *Ham.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1022: *C. B. Clarke in DC. Monogr.* vol. v. pars 1, p. 109.

Chirita barbata, *Sprague*; habitu similis *C. hamosae,* R. Br., a qua calycis forma et antheris barbatis recedit.

Herba erecta, circiter 60 cm. alta, caule crassiusculo pubescente. *Folia* ovato-oblonga, 7–14 cm. longa, 3–6 cm. lata, apice subacuta, recurva, basi subcordata, utrinque villoso-pubescentia, venis lateralibus utrinque 8–10, supra in vivo impressis, subtus prominentibus; petioli 0·5–3 cm. longi, cum pedunculis conjuncti. *Pedicelli* liberi, 4–8 pro folio, petiolis insidentes, ut calyces breviter villosi, usque ad 2 cm. longi. *Calyx* fere ad basin partitus, segmentis lanceolato-oblongis subacutis in basin angustatis circiter 1·2 cm. longis 3 mm. latis superne patulis. *Corolla* oblique infundibuliformis, paullo supra basin antrorsum curvata, antice ventricosa, intus antice lutea ceterum caeruleo-lilacina, tubo 2·5–3 cm. longo, limbo patulo 2·5–3 cm. lato. *Stamina* 2, antica; filamenta circiter 6 cm. longa, vix 1 cm. supra basin corollae inserta; antherae parallelae, connectivis versus latera corollae spectantibus, apice leviter depressae, appendiculatae, appendiculis confluentibus, dense lanatae, praesertim facie interiore. *Staminodia* 3, filiformia. *Discus* annularis. *Ovarium* dense villosum; stylus stamina superans, stigmatis lobis ellipticis basi leviter connatis intus dense pubescentibus. *Capsula* immatura 5 cm. longa, villoso-pubescens.—*C. hamosa,* E. André, in Rev. Hortic. 1895, p. 492, fig. 161; l.c. 1896, p. 184, cum tab. col.; non R. Br.

Chirita barbata is like *C. hamosa* in having the peduncles united with the petioles, so that the flowers seem to spring from the latter, but there the resemblance ends. The two species differ in the leaves, in the size and shape of the calyx and corolla, and in the anthers, which are very woolly in *C. barbata* and glabrous in *C. hamosa.*

C. barbata was brought into commerce as *C. hamosa* in 1895 by Mr. J. Sallier of Neuilly, Seine, France, who in reply to an inquiry has courteously given us all the information at his disposal. He obtained the species from the late Prof. H. Baillon, who informed him that it had been introduced by seed from the "mountains of India." There are no wild specimens of *C. barbata* in the Kew Herbarium, and it seems probable that it is a native of one of the French possessions in the East Indies. *C. hamosa*

and other species occur on damp rocks by the side of streams.

Description.—*Herb*, perennial. *Stem* erect, 2 ft. high, pubescent. *Leaves* ovate-oblong, 3–6 in. long, 1–2½ in. broad, apex subacute, recurved, base subcordate, villous-pubescent on both surfaces, nerves 8–10 on each side of the midrib, impressed on the upper surface, prominent on the lower; petioles ½–1 in. long. *Peduncles* connate with the petioles; pedicels free from one another, 4–8 on each petiole. *Calyx* deeply divided, segments lanceolate-oblong, about ½ in. long. *Corolla* funnel-shaped, ventricose, bluish lilac with a yellow band in front; tube 1 in. or more long; lobes slightly spreading. *Stamens* 2, anterior; anthers parallel, slightly depressed at the apex and joined to one another by a common appendage, connectives facing outwards. *Staminodes* 3, filiform. *Disk* annular. *Ovary* densely villous; style exceeding the stamens. *Capsule* (unripe) 2 in. long, villous-pubescent.—T. A. Sprague.

Cultivation.—*Chirita barbata* has been cultivated at Kew for the last twelve years, being treated as a biennial and grown along with such plants as *Sinningia*, *Achimenes*, etc. The seeds, which are matured freely by cultivated plants, are sown in early spring, and under liberal treatment the seedlings grow to a good size by the autumn. Leaf-cuttings also may be used for propagation as with *Sinningiae* and other Gesneraceae. They flower freely the following spring, well-grown plants being quite attractive when in full flower. As a garden plant *C. barbata* is less beautiful than *C. Moonii* from Ceylon, which grows a yard high and has purplish flowers, 4 in. across, freely produced in the axils of the whorled ovate-lanceolate leaves; nor is it as charming as the Chinese *C. depressa*, which has the habit of a *Sinningia* and long-tubed blue flowers nestling among the fleshy leaves. Both of these plants are grown in the stoves at Kew.—W. Watson.

Fig. 1, section of calyx, showing ovary and disk; 2, corolla-tube laid open, showing attachment of stamens and staminodes; 3, back of anthers; 4, stigma; 5, young fruit:—*all more or less enlarged.*

8201

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TAB. 8201.

GENISTA GLABRESCENS.

Central Europe.

LEGUMINOSAE. Tribe GENISTAE.

GENISTA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 482; *Taubert in Engl. et Prantl. Natürl. Pflanzenfam.* vol. iii. i. p. 231.

Genista (§ Lembotropis) glabrescens, *Briq. in Les Cytises des Alpes Maritimes,* 1894, p. 123; *De Wildeman in Icon. Hort. Then.* vol. ii. t. 52; *G. nigricanti,* Scheele, affinis, sed floribus solitariis vel geminatis, non racemosis, differt.

Frutex circiter 1 m. altus, ramulis junioribus quadrangularibus parce pilosis. *Folia* trifoliolata, petiolis usque ad 3 cm. longis sparsiuscule sericeo-pubescentibus; foliola subsessilia, obovata vel oblonga, 10–15 mm. longa, 4–7 mm. lata, apice rotundata vel interdum leviter emarginata, supra glabrescentia, subtus tenuiter sericeo-pubescentia, nervis lateralibus inconspicuis. *Flores* axillares, solitarii vel geminati; pedicelli petiolos aequantes. *Calyx* subcampanulatus, 4 mm. longus, breviter bilabiatus, labiis quam tubo brevioribus, extus parce villosus; labium superum bidentatum; inferum tridentatum. *Vexillum* subrotundatum, multinervium, circiter 1 cm. diametro, ungue 3 mm. longo. *Alae* obovatae, 1 cm. longae, 0·5 cm. latae, 7-nerviae, unguibus 3 mm. longis. *Carina* 1 cm. longa, rostrata, ungue 3 mm. longo. *Tubus staminalis* glaber, 1 cm. longus. *Antherae* oblongae, 1 mm. longae. *Ovarium* glabrum, stylo 0·5 cm. longo, stigmate minuto. *Legumen* 3–4 cm. longum, 6–8 mm. latum, glabrum. *Semina* 5 vel 6, reniformia, estrophiolata.—*Cytisus glabrescens*, Sartorelli, Alb. Indig. Ital. Sup. 1816, p. 282.—*C. emeriflorus*, Reichb. Fl. Germ. Excurs. 1832, p. 524. *Laburnum glabrescens*, Parlatore, Flora Ital. 1894, vol. x. p. 128.

The species here figured is confined to the Lepontine Alps in the vicinity of Lake Como on the borders of Italy and Switzerland, where it grows on mountain sides at high altitudes. It forms by itself the subsection *Emeroides*, Briquet, characterised by the solitary or geminate, axillary flowers, just as *G. nigricans* is the solitary species of the subsection *Eulembotropis*, Briquet, which has the flowers arranged in terminal leafless racemes.

The limits of *Genista* and *Cytisus* have been variously drawn by botanists, and some, including Baillon, combined them. Briquet, however, in his Les Cytises des Alpes Maritimes, places the species with a well-developed strophiole in *Cytisus*, and those with a rudimentary strophiole, or none, in *Genista*.

JUNE, 1908.

DESCRIPTION.—*Shrub* about 3 ft. high. *Young branches* quadrangular, sparingly pilose. *Leaves* trifoliolate; petioles 1–$1\frac{1}{4}$ in. long; leaflets subsessile, obovate or oblong, about $\frac{1}{2}$ in. long, $\frac{1}{6}$–$\frac{1}{4}$ in. broad, rounded or slightly emarginate at the apex, glabrescent above, thinly clothed with silky hairs beneath; lateral nerves indistinct. *Flowers* yellow, axillary, solitary or two together; pedicels equalling the petioles. *Calyx* subcampanulate, $\frac{1}{6}$ in. long, shortly two-lipped, lips shorter than the tube, sparingly villous outside; upper lip bidentate; lower tridentate. *Standard* somewhat rounded, many-veined, scarcely $\frac{1}{2}$ in. across, claw $\frac{1}{8}$ in. long. *Wing petals* obovate, $\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad, 7-nerved, claw $\frac{1}{8}$ in. long. *Keel petals* $\frac{1}{2}$ in. long, claw $\frac{1}{8}$ in. long. *Staminal tube* glabrous, $\frac{1}{2}$ in. long; anthers oblong. *Ovary* glabrous; style $\frac{1}{4}$ in. long, stigma minute. *Pod* 1–$1\frac{1}{2}$ in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, glabrous. *Seeds* 5 or 6, reniform, without a strophiole.—J. HUTCHINSON.

CULTIVATION.—Although *Cytisus glabrescens* is not a newly discovered plant, it has only appeared in cultivation during comparatively recent years. The plant from which the accompanying plate was prepared was obtained for the Kew collection in 1896, from Mr. Späth of Berlin. It has proved to be quite hardy and one of the most attractive of the dwarfer Brooms, flowering in May, and thriving well in a light loamy soil, in a position exposed to full sunshine. It is of a close, dense habit, and is admirably adapted for the Rock Garden or for any position where it is not in danger of being overgrown by plants of stronger habit. The original plant at Kew, after twelve years, is still not more than 18 in. high. It can be increased by cuttings, dibbled in sandy soil under a cloche during August.—W. J. BEAN.

Fig. 1, calyx and stamens; 2, calyx laid open with pistil; 3, wing-petal; 4, keel-petal; 5 and 6, anthers; 9, seed:—*all enlarged*; 7, fruit; 8, seed:—*natural size*.

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CONTENTS OF No. 42, JUNE, 1908.

Tab. 8197.—PANDANUS HOULLETII.
,, 8198.—RHODODENDRON MICRANTHUM.
,, 8199.—BULBOPHYLLUM FASCINATOR.
,, 8200.—CHIRITA BARBATA.
,, 8201.—GENISTA GLABRESCENS.

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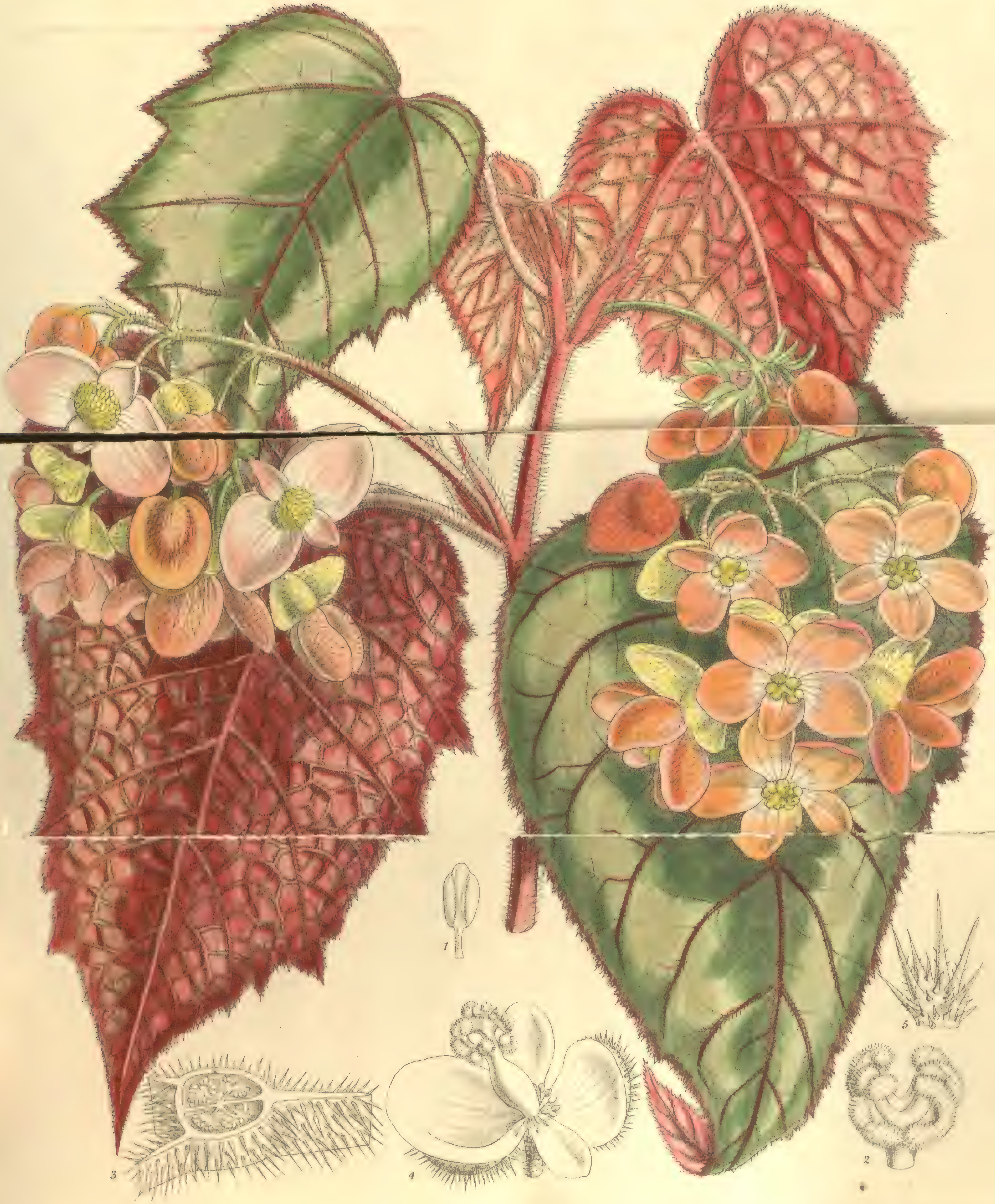

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Tab. 8202.

BEGONIA CATHAYANA.

China.

Begoniaceae.

Begonia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 841.

Begonia (§ Platycentrum, A.DC.) **cathayana,** *Hemsl.*; species ex affinitate *B. Bowringianae*, Champ. (B. M. t. 5182) et *B. laciniatae*, Roxb. (B. M. t. 5021), ab utraque caulibus foliisque sanguineo-velutinis et floribus miniatis differt; ab illa stipulis linearibus elongatis acuminatissimis et pedunculis multifloris petiolos excedentibus recedit.

Herba subcarnosa, ramosa, erecta, 0·5–1·0 m. alta, pilis leprosis sanguineis patentibus mollibus paucis albis intermixtis vestita, ramis teretibus articulatis. *Folia* longe petiolata, oblique cordata, absque petiolo usque ad 25 cm. longa, plus minusve lobulata, simul denticulata, longe acuminata, lobis basilaribus rotundatis, subtus sanguinea, supra praeter venas sanguineas viridia cum zona pallidiore; petioli teretes, usque ad 15–18 cm. longi; stipulae lineares, acutissimae, circiter 3 cm. longae. *Cymae* axillares, solitariae, 8–10-florae, pendulae, foliis breviores, bracteis parvis inconspicuis. *Flores* hirsuti, unisexuales, monoici, miniati, 3·5–4·5 cm. diametro. *Flores masculi*: perianthii phylla 4, patentissima, 2 exteriora ovato-elliptica, apice rotundata, 1·75–2 cm. longa, 2 interiora anguste ovata, vix 1 cm. longa; androecium globosum, breviter stipitatum, circiter 7 mm. altum. *Flores feminei*: perianthium fere aequaliter 5-phyllum, phyllis oblongo-ovatis; styli 2 basi connati, apice bicrures, cruribus tortuosis. *Capsula* pendula, pedicello subito recurvo setuloso, inaequaliter 3-alata; alae rotundatae, major circiter 2 cm. longa, minores 6–7 mm. longae.—*B. Bowringia*, Hort.; Gard. Chron. 1903, vol. xxxiii. p. 245, cum fig. suppl., non Champ.

This and the two species with which it is compared in the above description are very closely allied in structure. Indeed *B. Bowringiana* and *B. laciniata* have been treated as varieties of one species by De Candolle and others; but the plants cultivated and figured in this Magazine under these names are quite distinct. The cultivated *B. cathayana* is exactly the same as dried specimens in the Kew Herbarium, bearing the numbers 9198 and 13516, collected by Dr. A. Henry near Mengtze, Yunnan, at an elevation of 5,000 ft.

Description.—*Herb*, 2–3 ft. high, with fleshy stems and leaves, clothed with long, crimson, soft, scurfy hairs, interspersed on the branches with a few white ones.

July, 1908.

Leaves long-stalked; blade obliquely cordate, as much as 10 in. long, more or less distinctly lobed, minutely toothed, lateral lobes and tip sharp-pointed, basal lobes rounded, crimson below, green above except the crimson nerves, with a paler zone; stalks as much as 6–8 in. long; stipules narrow, pointed, about an inch long. *Clusters* axillary, 8–10-flowered, pendulous, shorter than the leaves; bracts small, inconspicuous. *Flowers* coarsely hairy, unisexual in the same clusters, vermilion, 1½–1¾ in. across. *Male flowers*: perianth of 4 petaloid leaves; 2 exterior nearly oval, about ¾ in. long; 2 interior narrow-ovate, less than ½ in. long; stamens numerous, in a stalked head. *Female flowers*: perianth nearly equally 5-leaved; leaves oblong-ovate; styles crested. *Capsule* hairy, pendulous from a sharp bend at the top of the stalk, unequally 3-winged, wings rounded, larger one ¾ in. long, smaller ¼ in. long.—W. BOTTING HEMSLEY.

CULTIVATION.—*Begonia cathayana* was introduced into cultivation by Mr. A. K. Bully of Ness, Neston, by means of seeds collected for him in China by Dr. A. Henry. The stock passed into the hands of Messrs. F. Sander and Sons, St. Albans, from whom the plant figured was obtained for Kew. Messrs. Sander and Sons have raised a batch of hybrids from *B. cathayana* and *B. Rex* which are remarkable for richness of leaf coloration. *B. cathayana* is a handsome stove plant. Under liberal treatment it develops numerous stems 18 in. high, bearing in September numerous clusters of flowers. It ripens seeds under cultivation. Cuttings of the stems and leaves root freely.—W. WATSON.

Fig. 1, a stamen; 2, stigma; 3, cross section of a capsule; 4, a pseudo-hermaphrodite flower with a superior ovary; 5, a hair from the perianth:—*all enlarged*.

8203

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TAB. 8203.

COELOGYNE PERAKENSIS.

Perak.

ORCHIDACEAE. Tribe EPIDENDREAE.

COELOGYNE, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 518; *Lindl. Fol. Orch. Coelog.* p. 1.

Coelogyne perakensis, *Rolfe*; a *C. sulphurea*, Reichb. f., pseudobulbis majoribus, scaporum vaginis longioribus et bracteis manifeste angustioribus differt.

Herba epiphytica, circa 30–40 cm. alta. *Pseudobulbi* approximati, ovoideo-oblongi, 4–5 cm. longi, monophylli. *Folia* longe petiolata, anguste elliptica vel oblongo-lanceolata, subacuta, coriacea, 12–17 cm. longa. *Scapi* sub anthesi ad basin pseudobulbi longius imbricato-vaginati, 15–22 cm. longi, erecti; racemi laxi, multiflori. *Bracteae* lineares, acutae, mox reflexae, deciduae, 2–2·5 cm. longae, carneae. *Pedicelli* graciles, circa 1 cm. longi. *Sepala* patentia, lanceolato-oblonga, subobtusa, paullo concava, 1·3–1·5 cm. longa, ochracea. *Petala* linearia, obtusa, revoluta, sepalis breviora, pallide viridia. *Labellum* trilobum, sepalis brevius, pallide flavum, medio macula aurantiaca ornatum; lobi laterales lineares, subfalcati, obtusi, patentes; lobus intermedius obcordato-bilobus, segmentis latis obtusis; discus lamellis 2 carnosis laevibus ornatus. *Columna* clavata, arcuata, late alata, circa 5 mm. longa. *Pollinia* 4, ad glandulam latam adnata.—*Coelogyne sulphurea*, Hook. f. Fl. Brit. Ind. vol. v. p. 833 (non Reichb. f.); Ridl. Mater. Fl. Malay Penins. part 1, p. 132.

Two quite distinct species have been confused under the name *Coelogyne sulphurea.* The original was based upon *Chelonanthera sulphurea*, Blume, Bijdr. p. 283, a native of Java, but Sir J. D. Hooker afterwards included under the name a Perak plant which had been collected by Scortechini and Wray, and in this he was followed by Mr. H. N. Ridley, the latter pointing out that in some respects the species was almost intermediate between the genera *Coelogyne* and *Pholidota.* The late Dr. E. Pfitzer, in monographing the *Coelogyne* group, proposed several new genera, and among them *Chelonistele*, in Engl. Pflanzenreich, Orch. Coelog. p. 136, to include *Coelogyne sulphurea*, Reichb. f., and four other species, *Chelonanthera* being retained for Blume's original *Chelonanthera gibbosa* and one other; but the differences between them are so slight that the old name

Coelogyne is here preferred. Should *Chelonistele* be ultimately retained, however, the name *Chelonistele perakensis* will apply to the present plant. Pfitzer does not cite either the Perak plant or the Flora of British India under his *Chelonistele sulphurea*, so probably did not include it, but the only other species with which it could be confused are *Coelogyne tenuiflora*, Ridl., a native of Borneo, and *C. lurida*, L. Lind. and Cogn., whose habitat is not recorded. Both are figured, however, and as Ridley treats the former as distinct, while the latter has the bracts and side lobes of the lip relatively twice as broad, the only possible course is to consider the present one as distinct.

The Javan *Coelogyne sulphurea*, Reichb. f., has long been cultivated at Kew, and in 1903 the Malayan plant was received from the Royal Botanic Garden, Glasnevin, under the same name. The two species flowered together during January of the present year, thus affording an opportunity of clearing up the confusion between them.

DESCRIPTION.—*Epiphyte*, 1–1¼ ft. high. *Pseudobulbs* approximate, ovoid-oblong, 1½–2 in. long, 1-leaved. *Leaves* long-petioled, oblong-lanceolate or narrowly elliptical, subacute, coriaceous, 5–7 in. long; petiole 2–4 in. long. *Scapes* erect, borne with the young growths from the base of the old pseudobulbs, ½–¾ ft. high, the basal half covered with imbricating brown sheaths; raceme lax, many-flowered. *Bracts* linear, acute, soon reflexed, and deciduous, ¾–1 in. long, rose-pink. *Pedicels* slender, nearly ½ in. long. *Sepals* spreading, lanceolate-oblong, subobtuse, somewhat concave, about ½ in. long, light buff. *Petals* linear, obtuse, revolute, rather shorter than the sepals, light green. *Lip* strongly 3-lobed, rather shorter than the sepals; light yellow with a deep yellow blotch on the disc; side lobes linear, slightly falcate, obtuse, spreading; front lobe obcordately 2-lobed, with broad obtuse segments; disc with a pair of smooth fleshy keels. *Column* clavate, broadly winged, somewhat curved, less than half as long as the lip. *Pollinia* 4, attached to a broad viscus.—R. A. ROLFE.

Fig. 1, flower, with sepals removed and 1 petal uncurled; 2 and 3 pollinia, seen from front and back; 4, whole plant:—1–3 *enlarged*, 4 *much reduced*.

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TAB. 8204.

DIDYMOCARPUS CYANEA.

Malay Peninsula.

GESNERACEAE. Tribe CYRTANDREAE.

DIDYMOCARPUS, *Wall.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1021; *C. B. Clarke in DC. Monogr.* vol. v. pars 1, p. 70.

Didymocarpus cyanea, *Ridl. in Journ. Bot.* 1900, p. 68; affinis *D. lacunosae*, Hook. f. (B. M. t. 7236), a qua omnibus partibus majoribus differt.

Herba acaulis. *Folia* pluria, rosulata, patula vel ascendentia, ovata, elliptica, vel obovata, apice subobtusa, basi rotundata vel plus minusve angustata, 7–15 cm. longa, 4–7 cm. lata, crenato-serrata, utrinque subtus longius molliter pubescentia, venis lateralibus utrinque 7–8 supra impressis subtus prominentibus; petioli 2–6 cm. longi. *Scapi* 2 vel plures, erecti, circiter 15 cm. longi, 4–5-flori, pedunculis villoso-pubescentibus 6–7 cm. longis. *Bracteae* lineares vel anguste oblanceolatae. *Pedicelli* circiter 2·5 cm. longi. *Calyx* usque ad basin partitus, segmentis suberectis lineari-subulatis circiter 12 mm. longis extra pubescentibus. *Corolla* cyanea, tubiformis, circiter 3·5 cm. longa, lobis patulis. *Stamina* duo antica perfecta, filamentis infra medium tubi insertis, antheris connatis; staminodia tria, posticum lateralibus minus. *Discus* annularis, crenatus, vix 1·5 mm. altus. *Ovarium* elongatum, ut stylus glanduloso-pubescens.

There are no authentically named specimens of *Didymocarpus cyanea* in the Kew Herbarium, but the plant figured agrees so well with the original description, except as regards the scapes, which are described as 2-flowered, that there is little doubt as to its belonging to that species.

D. cyanea was collected at Kasum, in the Siamese part of the Malay Peninsula, by Mr. C. Curtis, Superintendent of the Botanic Gardens, Penang.

Ridley remarks that the number of *Didymocarpi* in the Siamese-Malayan region seems endless, every district supplying one or more new kinds; and the same holds good for many other genera of Gesneraceae in different parts of the world, as for example the Tropical American genus *Columnea*, of which more than twenty species have been described from Costa Rica alone.

DESCRIPTION.—*Herb*, stemless. *Leaves* in a rosette, spreading or ascending, ovate, elliptic or obovate, apex rather obtuse, base rounded or narrowed, 3–6 in. long, 1½–3 in. broad, crenate-serrate, softly pubescent, lateral nerves 7–8 on each side of the midrib, impressed above, prominent below; petioles ¾–2½ in. long. *Scapes* 2 or more, 4–5-flowered; peduncles villous-pubescent, 2½ in. long. *Calyx* divided to the base; segments suberect, linear-subulate, ½ in. long, pubescent outside. *Corolla* deep blue, trumpet-shaped, about 1½ in. long, lobes patulous. *Stamens* 2 only perfect, anticous; filaments inserted below the middle of the tube, broadened towards the middle, white; anthers connate; staminodes 3, the posticous smaller than the lateral ones. *Disk* annular. *Ovary* elongated, glandular-pubescent.—T. A. SPRAGUE.

CULTIVATION.—*Didymocarpus cyanea* was first grown at Kew in 1902, when seeds of it were received from Mr. C. Curtis, Superintendent, Botanic Gardens, Penang. It has also been received from Professor Costantin, Jardin des Plantes, Paris. It flowers in the autumn, the pretty dark blue flowers opening in slow succession in a tropical house, where it receives the same treatment as *Sinningia* and the *Streptocarpi*. Although the Malayan species of this genus have been again and again tried as garden plants at Kew, they have never been a success. Probably they require to be treated as annuals, and as they do not mature seeds under cultivation, they soon die out. They are quite as pretty as their allies the *Streptocarpi*, which were at one time generically united with them, *S. Rexii* having been figured in this work, t. 3005 (1830), as *Didymocarpus Rexii*, while *D. malayana*, B. M. t. 7526, has all the appearance of a yellow flowered *Streptocarpus*.—W. WATSON.

Fig. 1, section of calyx showing the disk and pistil; 2, base of corolla laid open showing the staminodes; 3, immature fruit:—1 *and* 2 *enlarged*, 3 *natural size.*

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TAB. 8205.

OLEARIA RAMULOSA, var. COMMUNIS.

Australia.

COMPOSITAE. Tribe ASTEROIDEAE.

OLEARIA, *Moench.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 276.

Olearia ramulosa, var. communis, *Benth. Flora Austral.* vol. iii. p. 476; affinis *O. floribundae*, Benth., a qua foliis longioribus et capitulis minoribus paucioribus differt.

Frutex ramosus, 1–2 m. altus, ramis gracilibus teretibus magis minusve scabrido-pubescentibus. *Folia* lineari-lanceolata vel oblanceolata, integra, usque ad 1 cm. longa et 2 mm. lata, supra glaberrima vel muricato-scabrida, subtus lanata, marginibus recurvis. *Capitula* circiter 1·5 cm. diametro, ramulos breves laterales terminantia. *Involucri bracteae* 3-seriatae, oblongae, usque ad 4 mm. longae et 1 mm. latae, apice pubescentes, marginibus scariosis ciliatis. *Flores radii* circiter 9, albi; corollae tubus 3 mm. longus, extus parce pilosus; lamina elliptica, 4 mm. longa, 4-nervia, obtusa. *Flores disci* circiter 12; tubus 2·5 mm. longus, lobis acutis 1 mm. longis. *Antherae* apiculatae, 1 mm. longae. *Styli rami* papillosi. *Achaenia* 1 mm. longa, leviter compressa, parce pilosa. *Pappi setae* 2·5 mm. longae.—*Aster ramulosus*, Labill. Pl. Nov. Holl. vol. ii. 51, t. 198. *A. aculeatus*, Labill. l.c. 52, t. 200. *A. exasperatus*, Link, Enum. Hort. Berol. ii. 328. *Diplostephium aculeatum*, Nees, Gen. et Sp. 192. *D. ramulosum*, Nees, l.c. 193. *Eurybia ramulosa, E. propinqua, E. aculeata, E. epileia*, DC. Prod. vol. v. 270. *E. ericoides*, Steetz in Pl. Preiss. 1, 423.

About fifteen species of this exclusively Australasian genus are now cultivated in this country, and of these the plant here figured is probably the most graceful. It is widely spread in New South Wales, Victoria, Tasmania and South Australia, and is frequently found growing in waste places.

Bentham, in the Flora Australiensis, distinguishes two forms, *a. microphylla* and *b. communis*, and whether these be separable as species it is difficult to decide without a knowledge of the plants in the wild state. Those grown at Kew are strikingly uniform in habit, as well as in the shape of the leaves and size of the flowers, but the dried specimens preserved in the Herbarium show great variation.

DESCRIPTION.—*Shrub*, 3–6 ft. high with slender, terete, more or less scabrous, pubescent branches. *Leaves* linear-lanceolate or oblanceolate, entire, largest $\frac{1}{3}$ in. long and $\frac{1}{12}$ in. broad, almost glabrous or muricately-scabrid above, woolly below, margins recurved. *Flower-heads* about $\frac{1}{3}$ in. across, terminating short, lateral branchlets. *Bracts* of the involucre in 3 series, oblong, longest $\frac{1}{6}$ in. long, pubescent at the apex, margins scariose, ciliate. *Ray-flowers* about 9; tube $\frac{1}{6}$ in. long, sparsely pilose outside, limb elliptic $\frac{1}{6}$ in. long, 4-nerved, obtuse. *Disk-flowers* about 12; tube $\frac{1}{12}$ in. long, lobes acute. *Anthers* apiculate. *Style-branches* papillose. *Achenes* $\frac{1}{12}$ in. long, slightly compressed, sparsely pilose; setae of the pappus $\frac{1}{12}$ in. long.—J. HUTCHINSON.

CULTIVATION.—*Olearia ramulosa* is an old garden plant which has been grown at Kew many years for greenhouse decoration. It forms an elegant shrub a yard or so high, and the long freely branched shoots when clothed in early spring with white aster-like flowers are particularly ornamental. Grown in pots out of doors during summer and wintered in a greenhouse it is easily kept in health, and if afforded a little extra heat in December it will flower readily some weeks earlier than its usual time. Like all the species of *Olearia* it is easily propagated by means of cuttings. In the South of England and Ireland it may be seen here and there treated as a wall shrub, the main shoots being trained against the wall, and from these there is annually produced a thick crop of long branchlets which flower freely in spring. After flowering, these shoots are spurred back.—W. WATSON.

Fig. 1, branchlet bearing an unopened flower head; 2, a ray-flower; 3, a disk-flower; 4, a bristle of the pappus; 5, anthers; 6, stigma:—*all enlarged.*

8206

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TAB. 8206.

RHODODENDRON MARIESII.

Central China.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (§ Azalea) **Mariesii,** *Hemsl. et E. H. Wilson in Kew Bull.* 1907, p. 244; affinis *R. rhombico*, Miq., a quo ramulis glabris, foliis ovato-lanceolatis pilis longissimis appressis subtus vestitis, squamis latioribus et corolla albo-roseo-maculata differt.

Frutex 1–2 m. altus, ramis nitidis glabris. *Folia* ovato-lanceolata, acuta, 5–7 cm. longa, 2–3·5 cm. lata, basi magis minusve cuneata, juniora supra longe sericeo-pubescentia, subtus parce pubescentia, adulta demum glabra, nervis lateralibus utrinque 3–4, inferioribus oblique ascendentibus superioribus subpatulis subtus elevatis, venis arcte anastomosantibus; petioli 3–8 mm. longi. *Gemmae* ovoideae, squamis late ovatis vel oblongis apiculatis extus apice pubescentibus. *Flores* saepe geminati (rarius ternati), albo-rosei, purpureo-maculati; pedicelli erecti, 0·5–1 cm. longi, hispidi. *Calyx* annularis, dense setosus. *Corolla* alte 5-lobata, utrinque glabra, tubo 5–10 mm. longo, lobis 10–20 mm. longis patulis ellipticis obtusis. *Stamina* 10, breviter exserta, filamentis 2–2·5 cm. longis glabris, antheris 2 mm. longis. *Ovarium* 3–5 mm. longum, ovoideum, dense setosum, stylo 3–3·5 cm. longo glabro.—*R. Farrerae*, var. *Weyrichii*, Diels, in Engl. Bot. Jahrb. vol. xxix. p. 513.

Rhododendron Mariesii is very closely allied to *R. rhombicum*, Miq., figured at tab. 6972 of this Magazine, but the two species inhabit widely distant regions. *R. rhombicum*, which is distinguished from the species here figured by having pure lilac flowers without any spots, ovate leaves, and hairy branches, has so far only been recorded from Japan, where it grows in mountain forests; whereas *R. Mariesii* is confined to Central China.

According to Wilson, *R. Mariesii*, *R. indicum* and *R. sinense* are the only species of *Rhododendron* which occur below 4,000 ft. in Central China. Between this altitude and 15,000 ft. other species are found in great abundance.

DESCRIPTION.—*Shrub*, 3–6 ft. high; branches shining, glabrous. *Leaves* ovate-lanceolate, acute, 2–2¾ in. long, ¾–1⅓ in. broad, more or less wedge-shaped at the base, in the young state with long silky hairs on the upper surface, sparingly pubescent below, at length becoming glabrous; lateral nerves 3–4, suberect at the base, more spreading in the upper part, raised below; veins closely reticulated; petioles $\frac{1}{6}$–$\frac{1}{3}$ in. long. *Buds* ovoid; scales broadly ovate or oblong, apiculate, pubescent outside towards the apex. *Flowers* usually in pairs, pale pink with purple spots on the upper segments; pedicels erect, $\frac{1}{6}$–$\frac{1}{3}$ in. long, hispid. *Calyx* annular, densely setose. *Corolla* deeply 5-lobed, glabrous on both sides; tube $\frac{1}{6}$–$\frac{1}{3}$ in. long, lobes $\frac{1}{3}$–$\frac{3}{4}$ in. long, spreading, elliptic, obtuse. *Stamens* 10, shortly exserted; filaments glabrous; anthers $\frac{1}{12}$ in. long. *Ovary* ovoid, densely setose; style $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, glabrous.—J. HUTCHINSON.

CULTIVATION.—*Rhododendron Mariesii* was raised from seeds received at Kew in 1886 from Dr. Henry when at Ichang. The plants have received protection; that figured having flowered in the Himalayan House in April, 1907. The deciduous *Rhododendra* from China to which this species belongs are handsome spring-flowering shrubs, the best known of these, *R. sinense*, being one of the most popular of garden plants. It is probable that *R. Mariesii* will bear the temperature of the warmer parts of the British Islands; it ought to be quite at home in Devon and South Cornwall.—W. WATSON.

Fig. 1, calyx and pistil; 2 and 3, anthers:—*enlarged.*

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CONTENTS OF No. 43, JULY, 1908.

TAB. 8202.—BEGONIA CATHAYANA.
„ 8203.—COELOGYNE PERAKENSIS.
„ 8204.—DIDYMOCARPUS CYANEA.
„ 8205.—OLEARIA RAMULOSA, VAR. COMMUNIS.
„ 8206.—RHODODENDRON MARIESII.

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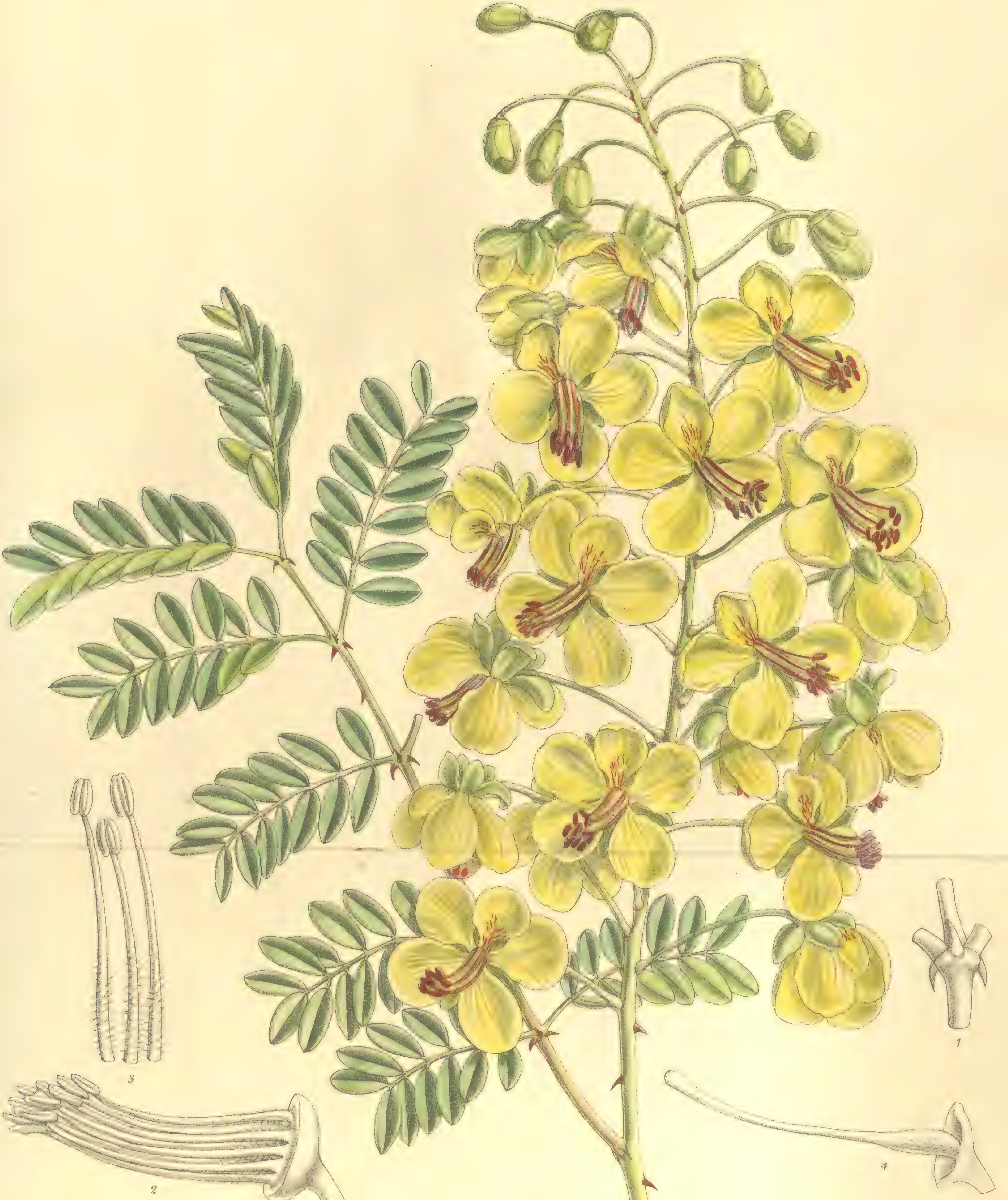

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TAB. 8207.

CAESALPINIA JAPONICA.

Japan and China.

LEGUMINOSAE. Tribe CAESALPINIEAE.

CAESALPINIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 565.

Caesalpinia japonica, *Sieb. et Zucc. in Abh. Akad. Muench.* 1843, vol. iv. 2, p. 117; *Franch. et Savat. Enum. Pl. Jap.* vol. i. p. 114; affinis *C. sepiariae*, Roxb., a qua racemis laxioribus glabris vel glabriusculis et pedicellis longioribus differt.

Frutex circiter 2 m. altus, diffuse ramosus, ramis longis aculeis recurvis armatis. *Folia* bipinnata; pinnae 3–8-jugae; nodi rhachis triaculeati, aculeis duobus recurvis in facie inferiore, unica adscendente in facie superiore; internodia rhachis inermia vel armata; foliola 5–10-juga, elliptico-oblonga vel obovato-oblonga, apice rotundata, basi rotundata vel obtusa, 1–2 cm. longa, 4–10 mm. lata, dense pellucide glanduloso-punctata, supra glabra, subtus puberula. *Stipulae* parvae, caducae. *Racemi* pedunculo brevi incluso 20–25 cm. longi, laxiflori, 25–35-flori, rhachi glabra rarius puberula; pedicelli graciles, circiter 3 cm. longi. *Calycis tubus* brevissimus; lobi ovato-oblongi, rotundati, circiter 7 mm. longi, tandem reflexi. *Petala* antica et lateralia lutea, late obovata, brevissime unguiculata, circiter 1·5 cm. longa et 1 cm. lata vel ultra; petalum posticum luteum, rubro-striolatum, obovatum, breviter unguiculatum marginibus supra unguem inflexis auriculiformibus, 1 cm. longum ungue 2 mm. longo excluso. *Stamina* 10, rubra, alterna breviora, filamentis inferne dense villosis. *Ovarium* oblongum, compressum, vix 4 mm. longum, stylo tubulari apice truncato ciliolato extus glabro. *Legumen* oblongum, rectum, 7–8 cm. longum, spinoso-cuspidatum, dorso carinatum. *Semina* 6–9, oblonga, laevia.—*C. crista*, Thunb. Fl. Jap. p. 179. *C. sepiaria*, Miq. Prol. p. 212; Maxim. Fl. As. Or. Fragm. p. 5; Hemsl. in Journ. Linn. Soc. Bot. vol. xxiii. p. 206; non Roxb.

There has been considerable difference of opinion amongst botanists from time to time as to whether *Caesalpinia japonica* should be united with *C. sepiaria* or not, but for gardening purposes it is certainly distinct. The racemes are much laxer in *C. japonica* and the pedicels are longer, whilst the uppermost petal has red markings, which apparently do not occur in *C. sepiaria*.

The colouring of the corolla recalls that of *C. vernalis*, B. M. t. 8132, which is, however, much less showy.

AUGUST, 1908.

DESCRIPTION.—*Shrub*, about 6 ft. high, straggling. Branches long, armed with recurved prickles. *Leaves* bipinnate, with 3–8 pairs of pinnae; rhachis furnished with two recurved prickles on the lower surface and one straight ascending prickle on the upper surface at each node, internodes of rhachis armed or unarmed; leaflets 5–10 pairs, elliptic-oblong or obovate-oblong, rounded at the apex, rounded or obtuse at the base, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{6}$–$\frac{5}{12}$ in. broad, densely dotted with pellucid glands, glabrous on the upper surface, puberulous on the lower. *Stipules* small and caducous. *Racemes* about 9 in. long, shortly peduncled, lax-flowered; rhachis usually glabrous; pedicels slender, over 1 in. long. *Flowers* about 30. *Calyx-tube* very short; lobes ovate-oblong, rounded, about $\frac{1}{4}$ in. long, finally reflexed. *Petals* lemon-yellow, obovate, the uppermost one smaller than the others, striped with red, and provided with two auricles above the short claw. *Stamens* 10, red, alternately shorter; filaments densely villous below. *Ovary* oblong, compressed, hardly $\frac{1}{6}$ in. long; style tubular, truncate, fringed at the apex, glabrous elsewhere. *Legume* oblong, straight, about 3 in. long, with a spine-like cusp at the apex of the ventral suture, and a prominent dorsal keel. *Seeds* 6–9, oblong, smooth.—T. A. SPRAGUE.

CULTIVATION.—*Caesalpinia japonica* first flowered in England in 1887 in the Coombe Wood nursery of Messrs. J. Veitch & Sons, by whom the plant had been introduced from Japan a few years previously. It is hardy only in sheltered positions in the south of England, the plant from which the present plate was prepared being one of a group established in a recess under the south wall of the Temperate House at Kew, where it has grown practically uninjured by frost for about five years. In some Cornish and Irish gardens it is quite at home, one of the largest specimens, which flowers freely every year, being in the garden of Lord Barrymore at Fota, near Cork. Whilst the species generally are strong climbers, this forms a somewhat straggling deciduous shrub, the shoots being comparatively short; the flowers are borne in terminal racemes on the young growths in June.—W. WATSON.

Fig. 1, node of the leaf rhachis, seen from above; 2 and 3, stamens; 4, pistil:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Ltd imp

L. Reeve & Co. London.

Tab. 8208.

INDIGOFERA HEBEPETALA.

Himalaya.

Leguminosae.

Indigofera, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 494.

Indigofera hebepetala, *Benth. ex Bak. in Hook. f. Fl. Brit. Ind.* vol. ii. p. 101; species ex affinitate *I. atropurpureae*, Ham. (B. M. t. 3065) a qua stipellis majoribus, bracteis latioribus alabastra involventibus cito tamen deciduis, corolla pallidiore kermesina, legumineque magis rostrato differt.

Frutex sylvestris elatior; rami juniores parcissime pilis appressis obsiti, demum glabri. *Folia* alterna, 3–5 cm. remota, imparipinnata, 18–20 cm. longa, petiolis 4 cm. longis; foliola 5–9, rarissime 11, terminale excepto opposita paribus 2·5–3·5 cm. remotis, membranacea, oblonga vel ovata, basi late cuneata vel subrotundata, apice obtusa vel subretusa, mucronulata, nervis 8–10-jugis, supra intense viridia, juniora parcissime appresse pilosa, cito glabrescentia, subtus pallidiora, parce sed persistenter appresse pilosa, 3·5–6 cm. longa, 2·5–4 cm. lata, petiolulis 3 mm. longis; rachis petioloque parce appresse pilosa, cito glabrescens; stipulae lanceolatae vel subulatae, 4 mm. longae, caducae; stipellae 2 mm. longae, subulatae. *Flores* racemosi; racemi axillares, 8–20 cm. longi, 20–40-flori, pedunculis 1·5–5 cm. longis rachibusque 6–16 cm. longis parce appresse pilosis; pedicelli 2 mm. longi; bracteae parce hirsutae, cymbiformes, intense kermesinae, 6 mm. longae, 4 mm. latae, alabastra obtectentes, in cuspidem recurvam abeuntes, cito deciduae. *Calyx* oblique campanulatus, 3 mm. longus, dentibus triangulis tubo duplo brevioribus, extus parce appresse pilosus. *Corolla* 1·25 cm. longa, vexillo intense kermesino extra parce sericeo, alis roseis, petalis carinae versus apices kermesinis ibique extra parce sericeis. *Legumen* cylindricum, rectum, glabrum, apice acuto subrecurvum, 4–5 cm. longum, 5 mm. crassum, seminibus 8–10.

Indigofera hebepetala is widely distributed in the North-Western Himalaya, at elevations of 6,000–8,000 ft., from Hazara, where it was first collected by Dr. J. L. Stewart, and Kashmir, where it was originally obtained by Mr. V. Jacquemont, to Kamaon, where it was first seen by Dr. T. Thomson. So far it has not been recorded from Nepal, but it reappears in Inner Sikkim where it was first found by Sir J. D. Hooker in the Lachen Valley at 7,000 ft. The species is very closely allied to *I. atropurpurea*, Ham., which is met with as a rule at slightly lower elevations and has a somewhat wider distribution, since it extends to Indo-China and is believed to occur also in Southern China. *I. atropur-*

August, 1908.

purea, figured in this work at t. 3065, differs most markedly from *I. hebepetala* in the darker colour of its flowers, in the narrower and smaller bracts, and in the number of its leaflets, never fewer than 11, usually 13–17; in *I. hebepetala* the maximum number, very rarely met with, is 11, the usual number being 5–7, though leaves with 9 leaflets are not uncommon. Though long ago segregated by Mr. Bentham, no description of this species was published till the Indian Leguminosae were taken up in the second volume of the Flora of British India. Owing to the inclusion in the species of what was then taken for a sub-alpine form with smaller leaflets, but is now known to belong to another species, the number of leaflets in the original description is given as 13–17, and the range of elevation is stated to be from 6,000 to 15,000 ft. The actual number of leaflets is, however, as stated above, 5–11, and the known range of elevation of the species is from 6,000–8,000 ft.

DESCRIPTION.—*Shrub*, of considerable size. *Branchlets* at first sparingly beset with adpressed hairs, soon glabrous. *Leaves* alternate, $1\frac{1}{4}$–2 in. apart, including the $1\frac{1}{2}$ in. long petiole 7–8 in. in length; leaflets 5–9, very occasionally 11, opposite except the distal leaflet, the pairs 1–$1\frac{1}{4}$ in. apart, wide cuneate or rounded, obtuse or subretuse, mucronulate, nerves 8–10-paired, dark green at length glabrous above, paler more persistently adpressed pilose beneath, $1\frac{1}{4}$–$2\frac{1}{2}$ in. long, 1–$1\frac{1}{2}$ in. wide, the petiolules $\frac{1}{8}$ in. long; petiole and rachis soon glabrous; stipules lanceolate or subulate, $\frac{1}{6}$ in. long, caducous; stipels $\frac{1}{12}$ in. long, subulate. *Flowers* in axillary 20–40-flowered racemes 3–8 in. long; peduncles $\frac{1}{2}$–2 in. long; pedicels $\frac{1}{12}$ in. long; bracts deciduous, crimson, sparingly hairy, boat-shaped and enclosing the buds, $\frac{1}{4}$ in. long, $\frac{1}{6}$ in. across, ending in a recurved cuspidate tip. *Calyx* sparingly pilose, obliquely campanulate, $\frac{1}{8}$ in. long, the lobes triangular, half as long as tube. *Corolla* $\frac{1}{2}$ in. long, with dark crimson standard sparingly silky outside, rose-coloured wing-petals and keel-petals with dark crimson sparingly silky tips. *Pod* cylindric, straight, glabrous, with a sharp slightly recurved tip, $1\frac{1}{2}$–2 in. long, $\frac{1}{5}$ in. thick, 8–10-seeded.—D. PRAIN.

CULTIVATION.—So far as Kew is concerned this species is not new, for the plant from which the plate was prepared was one of the many species bequeathed to this establishment by the late Mr. G. C. Joad in 1881. It is, however, scarcely known in gardens generally. Like its better known congener, *I. Gerardiana*, its shoots at Kew die back to the ground when the plant is grown in the open. Every year, however, a crowd of slender, erect or suberect stems about 4 ft. in length is sent up from the rootstock, and these flower freely during August and September. The shoots are not naturally of annual duration, and if the plants were grown against a wall they would probably survive our winters. The number of hardy shrubs which flower at the same season as this is so limited that every addition to them is welcome.—W. J. BEAN.

Fig. 1, buds enveloped by the deciduous bracts; 2, a single flower, partially laid open; 3, calyx and stamens; 4, a keel-petal; 5, pistil; 6, fruits:—*figs.* 1–5 *enlarged.*

8209

M.S. del, J.N. Fitch lith.

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TAB. 8209.

EUCRYPHIA CORDIFOLIA.

South Chile.

EUCRYPHIACEAE.

EUCRYPHIA, *Cav.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 615; *Focke in Engl. et Prantl, Nat. Pflanzenf.* vol. iii. vi. p. 131.

Eucryphia cordifolia, *Cav. Ic.* vol. iv. p. 49, t. 372; *C. Gay, Hist. Chile, Bot.* vol. i. p. 351; ab *E. Billardieri*, Spach, specie affini tasmanica, differt foliis subtus molliter pubescentibus crenulatis vel serrato-dentatis, ovariis glabris et carpellis numerosioribus.

Arbor sempervirens, in patria sua ultra 15 m. alta, trunco recto, 30–60 cm. diametro, superne copiose ramosa. *Rami* juniores fulvo-tomentosi, tandem glabrescentes, vetustiores cortice fusco tecti. *Folia* late oblonga vel elliptico- vel ovato-oblonga, obtusa vel rarius acuta, basi magis minusve cordata vel truncata vel rotundata, margine repando-crenulata vel serrato-dentata, 4–8 cm. longa, 2·5–4 cm. lata, coriacea, primo utrinque pilosa, supra mox glaberrima, lucida, saturate viridia, infra cinerea, etiam matura molliter pubescentia, nervis lateralibus utrinque 7–11, venarum reticulatione supra conspicua, areolis minutis; petiolus crassiusculus 4–6 mm. longus, tomentosus. *Flores* in foliorum axillis solitarii, e gemmis perulatis orti, perulis ovato-rotundatis tomentosis; pedicelli tomentosi, 1–2 cm. longi, vel demum paulo longiores. *Sepala* 4, late oblonga, tomentella, unacum calyptratim delabentia. *Petala* 4, obovato-rotundata vel rotundata, vix unguiculata, tenuia, lactea, ad 2·5 cm. longa. *Stamina* numerosissima; filamenta basi efigurationibus thalami breviter tubulosis ciliatis cincta. *Ovarium* glabrum, carpellis stylisque 10–12. *Capsula* 12–15 mm. longa.

Eucryphia cordifolia is a native of Chile, south of Lat. 38° S. and particularly common in the humid forests of Chiloë and the provinces of Valdivia and Llanquihue. It is a most ornamental tree, known to the Chilians as Muermo or Ulmo. It was described and figured in 1797 by Cavanille, who established on it the genus *Eucryphia*, the systematic position of which has always been doubtful. First Sprengel suggested an affinity with Rosaceae, then Choisy attached it as an anomalous genus to Hypericaceae. Endlicher removed it to Chlaenaceae, whilst Spach was the first to point out a relationship with Ternstroemiaceae, particularly with *Laplacea*. Then in 1846 C. Gay made *Eucryphia* the representative of a new order Eucryphiaceae, which he placed near Chlaenaceae. Planchon, on the other hand, was inclined to refer it to Saxifragaceae, among which *Belangera* seemed to him to approach *Eucryphia*. This view was adopted by Bentham in the Flora Australiensis; but in Bentham and Hooker's Genera Plantarum *Eucryphia* was transferred to the Rosaceae-Guillajeae, to which group Baillon also assigns it as an anomalous type. Quite recently Hallier came to the same conclusion from an examination of the morphology and anatomy of the genus. Meanwhile Maximowicz had pointed to the Tiliaceae, and more especially the Sloaneae and Elaeocarpeae, as possible allies. Focke, however, the monographer of the Rosaceae in Engler and Prantl's Natürliche Pflanzenfamilien, restored C. Gay's Eucryphiaceae as a distinct family allied to Ternstroemiaceae and the other members of Engler's subseries Theineae, and it is accordingly placed between Dilleniaceae and Ochnaceae in Engler's system. Under these circumstances, and pending a more comprehensive examination of the genus, it seems expedient to follow Gay and Focke and treat *Eucryphia* as a distinct phylum with the status of a family.

Loudon gives 1878 as the year of introduction of *Eucryphia cordifolia* into English horticulture, but G. Don has a paragraph containing directions for its cultivation and propagation as early as 1831. However that may be, it remained practically unnoticed until 1897, when it flowered in Messrs. Veitch's nurseries at Coombe Wood, and a figure of it, together with a note by G. Nicholson, was published in the Gardeners' Chronicle. The leaves are shown here as obtuse and elliptic to elliptic-oblong. Subsequently another figure of *Eucryphia* was produced in the same Journal, representing the leaves as very acute. The specimen from which it was drawn came from the garden of Mr. Gumbleton, who had obtained his plant from the Coombe Wood nurseries, whence the branch figured on plate 8209 was derived. From the dried material at Kew it seems that whenever acute leaves appear it is generally the first leaves of a shoot which assume the acute shape, and in this they resemble the leaves of the seedling plant.

According to Gay the wood of *Eucryphia* is much used for joinery and light carpenter's work and also for fuel.

Description.—*Tree*, attaining in its native country over

40 ft. in height, with a straight trunk, 1–2 ft. in diameter. *Branches* tomentose when young, at length glabrescent; old branches with a brownish bark. *Leaves* broad-oblong, obtuse or sometimes acute, with crenulate or serrate-dentate margins, 2–3 in. long, 1–1$\frac{3}{4}$ in. broad, coriaceous, when mature quite glabrous, dark green and shining above, softly pubescent and greyish below, network of veins very close and distinct above; petiole tomentose, $\frac{1}{6}$–$\frac{1}{4}$ in. long. *Flowers* solitary, axillary, from perulate tomentose buds; pedicels tomentose, $\frac{1}{2}$–1 in. long. *Sepals* 4, oblong, velvety, thrown off together. *Petals* 4, obovate-rotundate, up to 1 in. long, thin, milk-white. *Stamens* very numerous. *Ovary* glabrous; carpels and styles 10–12. *Capsule* $\frac{1}{2}$–$\frac{2}{3}$ in. long.—OTTO STAPF.

CULTIVATION.—This shrub is essentially one for the milder parts of the British Isles. It has never succeeded at Kew even when planted against a sheltered wall. But for the gardens of the south and west of Ireland, the west of Scotland, Cornwall and similar localities, where the winters are mild and the summers equable and moist, it ought to prove a most charming acquisition. Like *E. pinnatifolia* (B. M. t. 7067), another but hardier species from Chile, it should be given a peaty soil such as Rhododendreae love. In fact, wherever such species of *Rhododendron* as *R. grande* and *R. Griffithianum* thrive, there, both as regards climate and soil, will this *Eucryphia* be very well suited.—W. J. BEAN.

Fig. 1, part of upper surface of very young leaf; 2, bud; 3 and 4, stamens; 5, pistil:—*all enlarged.*

8210

M.S.del J.N.Fitch lith.
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TAB. 8210.

RHODODENDRON KAMTSCHATICUM.

N.E. Asia and N.W. America.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (§ Therorhodion) **kamtschaticum**, *Pall. Fl. Ross.* vol. i. p. 48, t. 33; *Hook. Fl. Bor.-Am.* vol. ii. p. 43; *Maxim. Rhod. As. Orient.* p. 47; affinis *R. Redowskiani*, Maxim., a quo foliis obovatis ciliatis et stylo stamina superante differt.

Suffrutex parvus, ramis abbreviatis crassis, ramulis longe pilosis. *Folia* annua, sessilia, obovata vel spatulato-obovata, apice rotundata, mucronata, basi attenuata, 3–6 cm. longa, 1·5–2·5 cm. lata, chartacea, marginibus longe ciliatis, nervis lateralibus utrinque 2–3 arcuatis subtus longe pilosis, venis laxe reticulatis utrinque conspicuis. *Flores* solitarii, ramulos breves terminantes; pedicelli usque ad 2 cm. longi, longe parceque glanduloso-pilosi. *Calyx* 5-partitus, segmentis herbaceis oblongis obtusis 10–15 mm. longis 3–6 mm. latis 3-nerviis in nervis et marginibus glanduloso-pilosis. *Corolla* sanguineo-purpurea; tubus 3–6 mm. longus; lobi patuli, oblongo-elliptici, obtusi, circiter 2 cm. longi et 1 cm. lati, extus tenuiter villosi, intus basi tantum villosi. *Stamina* 10; filamenta inaequalia, usque ad 1·5 cm. longa, basi villosa, antheris 2 mm. longis glabris. *Ovarium* ovoideum, parce pilosum; stylus circiter 2 cm. longus, basi villosus, stigmate capitato breviter 5-lobo. *Capsula* oblonga, circiter 1·3 cm. longa.—*Rhodothamnus kamtschaticus*, Lindl. in Paxt. Fl. Gard. vol. i. t. 22.

Rhododendron kamtschaticum is found abundantly in the islands and along the coasts in the neighbourhood of Behring Strait. It extends southwards to Sachalin and the north of Japan, and eastward to Banks's Island off the coast of British Columbia. According to Pallas it occurs in muddy mountainous places, and begins to flower about the end of June.

This pretty species, which in general appearance reminds one of some of the Rock Roses, has been in cultivation for at least a hundred years, but, owing probably to the difficulty of its cultivation, it is still comparatively rare.

DESCRIPTION.—*Undershrub* about 6 in. high; branches thick; branchlets clothed with long hairs. *Leaves* annual, sessile, obovate or spathulate-obovate, rounded at the apex, narrowed to the base, 1¼–2½ in. long, ½–1 in. broad, papery,

AUGUST, 1908

long ciliate; lateral nerves 2–3 on each side of the midrib, arched, pilose below; veins conspicuous on both sides. *Flowers* solitary, terminating short branchlets; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in. long, glandular-pilose. *Calyx* 5-partite; segments herbaceous, oblong, obtuse, $\frac{1}{3}$–$\frac{1}{2}$ in. long, 3-nerved, nerves and margins pilose. *Corolla* carmine purple; lobes spreading, oblong-elliptic, obtuse, about $\frac{3}{4}$ in. long and $\frac{1}{2}$ in. broad, thinly villous outside. *Stamens* 10; filaments unequal, villous at the base, about $\frac{1}{2}$ in. long; anthers $\frac{1}{12}$ in. long, glabrous. *Ovary* ovoid, sparingly pilose; style villous at the base; stigma capitate, shortly 5-lobed. *Capsule* oblong, about $\frac{1}{2}$ in. long.—J. HUTCHINSON.

CULTIVATION.—This interesting and remarkable *Rhododendron* is not one of the easiest to cultivate in this country, and it cannot be accommodated so readily as most of the species. It is quite capable of withstanding any degree of winter cold it is likely to experience in the British Isles; but it is deciduous and, like many other deciduous plants from North Asia, is excited into growth early. In consequence it is liable to have its young growths injured by late spring frosts. Then it is, even more than most species of *Rhododendron*, a moisture-loving plant. At Kew it has succeeded best when grown in a mixture of peat and silver sand to which a certain spongy consistency has been given by adding a little chopped sphagnum. It should be given a position where it is shielded from early morning sun in spring, though otherwise fully exposed, and where the soil is, naturally or artificially, kept always moist. The plant from which our figure was prepared is one of a batch raised from seeds obtained from the Botanic Garden at St. Petersburg in 1900.—W. J. BEAN.

Figs. 1 and 2, stamens; 3, pistil:—*all enlarged.*

8211

M.S. del. J.N. Fitch lith.

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Tab. 8211.

POLYSTACHYA Lawrenceana.

East Tropical Africa.

Orchidaceae. Tribe Vandeae.

Polystachya, Hook.; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 540.

Polystachya Lawrenceana, *Kraenzl. in Gard. Chron.* 1893, vol. xiv. p. 150; *Rolfe in Thiselton-Dyer, Fl. Trop. Afr.* vol. vii. p. 124; inter species affines labello roseo distincta.

Herba epiphytica. *Pseudobulbi* ovoideo-oblongi, subcompressi, 2·5–4 cm. longi, vaginis membranaceis imbricatis tecti, 2-3-phylli. *Folia* lineari-oblonga, subobtusa, recurva, 6–11 cm. longa, 1·3–2 cm. lata, subcoriacea. *Scapi* terminales, 8–15 cm. longi, pubescentes, 4–8-flori. *Bracteae* late rhomboideo-ovatae, abrupte acuminatae, puberulae, 6–8 cm. longae. *Pedicelli* puberuli, circa 1 cm. longi. *Flores* speciosi, flavido-virides labello roseo, inversi. *Sepala* subpatentia, puberula; posticum ovatum, acutum, concavum, 8 cm. longum, lateralia ovata, acuta, concava, 1 cm. longa. *Petala* subconniventia, incurva, oblanceolato-oblonga, subobtusa, 8 cm. longa. *Labellum* superum, 3-lobum, 1 cm. longum; lobi laterales late rotundati vel obscure angulati, subobtusi, breves; lobus intermedius obovato-orbicularis, apiculatus, carnosulus, canaliculatus, circa 7 mm. latus; discus medio callo rotundato obscuro instructus, basi puberulus. *Columna* brevissima, lata, exalata.

Polystachya is a large and polymorphic genus, widely diffused through the warmer regions of the globe, though at present it is not known to occur further east than Borneo and the Philippine Islands. Its headquarters are in Tropical Africa, from which country 74 species were known when the Flora of Tropical Africa was published, and the number has since been increased to over one hundred. Very few of the species can be considered showy, and only three have hitherto been figured in this work, namely, *P. grandiflora*, Lindl., t. 3707, *P. bracteosa*, Lindl. (now considered to be synonymous with *P. affinis*, Lindl.), t. 4161, and *P. pubescens*, t. 5586, the two former being from Tropical Africa, the latter from extra-tropical South Africa. The one now figured is very distinct from these, and indeed from all others in cultivation, in its rose-pink lip, which renders the plant very attractive. It was discovered in the Upper Zambesi district by Mr. John Buchanan, who sent

August, 1908.

plants to Mr. James O'Brien, though from some misapprehension the habitat was recorded as Sierra Leone when the species was originally described from the collection of Sir Trevor Lawrence, Bart., Burford, Dorking, where it flowered in July, 1893. The former locality has since been confirmed, for the species has also been collected on the Zomba Hills, Nyasaland, at 6,000 feet elevation, by Lieut.-Col. W. H. Manning, in November, 1900. It is one of a group of Tropical African species, which are for the most part known only from dried specimens.

Description.—*Epiphyte,* about 6 in. high. *Pseudobulbs* ovoid-oblong, somewhat compressed, 1–1½ in. long, covered with membranous imbricating sheaths, 2–3-leaved. *Leaves* linear-oblong, subobtuse, recurved, 2½–4½ in. long, ½–¾ in. broad, subcoriaceous. *Inflorescence* terminal, 3–6 in. long, pubescent; raceme 4–8-flowered. *Bracts* broadly rhomboid-ovate, abruptly acuminate, puberulous, ¼–⅓ in. long. *Pedicels* puberulous, under ½ in. long. *Flowers* medium-sized, inverted, yellowish green with a rose-pink lip. *Sepals* somewhat spreading, puberulous; dorsal ovate, acute, concave, about ⅓ in. long; lateral ovate, acuminate, concave, rather longer than the dorsal. *Petals* subconnivent, incurved, oblanceolate-oblong, subobtuse, about ⅓ in. long. *Lip* superior, 3-lobed, nearly ½ in. long; side lobes rounded or obscurely angled, subobtuse, short; front lobe obovate-orbicular, apiculate, fleshy, channelled, nearly ⅓ in. broad; disc with an obscure rounded callus about the centre, puberulous behind. *Column* very short and broad, without wings.—R. A. Rolfe.

Cultivation.—Kew is indebted to the Royal Botanic Gardens, Glasnevin, for a plant of this pretty species of *Polystachya,* which was received in 1903 and flowered in June, 1906. There are not many of the numerous species of *Polystachya* that are sufficiently attractive to hold a place among garden orchids. Twenty-four of them are in cultivation at Kew, and of these the largest flowered is *P. grandiflora,* whilst the brightest coloured is the yellow-flowered *P. pubescens.* The species here figured is at least as attractive as either of these. Polystachyas generally are easily kept in health if grown in a warm, moist house, and afforded the same treatment as answers for *Dendrobium nobile*, namely, a small teak basket filled with a mixture of peat fibre and sphagnum for the roots, which should be kept wet during the growing season and dry whilst the plant is at rest. The flowers are developed in summer.—W. WATSON.

Fig. 1, lip, with one side lobe cut off; 2, column; 3 and 4, pollinia, seen from front and back:—*all enlarged.*

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CONTENTS OF No. 44, AUGUST, 1908.

TAB. 8207.—CAESALPINIA JAPONICA.
,, 8208.—INDIGOFERA HEBEPETALA.
,, 8209.—EUCRYPHIA CORDIFOLIA.
,, 8210.—RHODODENDRON KAMTSCHATICUM.
,, 8211.—POLYSTACHYA LAWRENCEANA.

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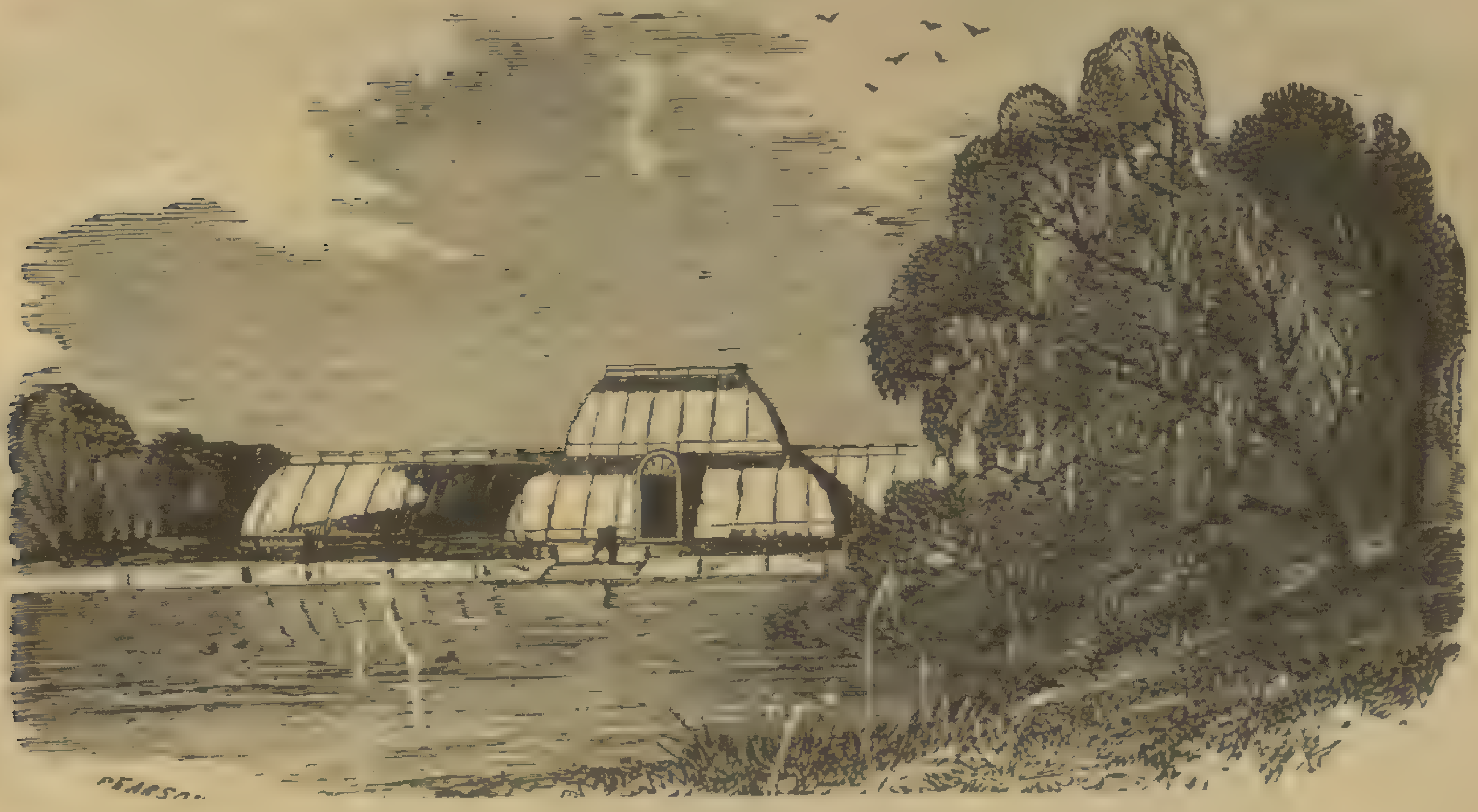

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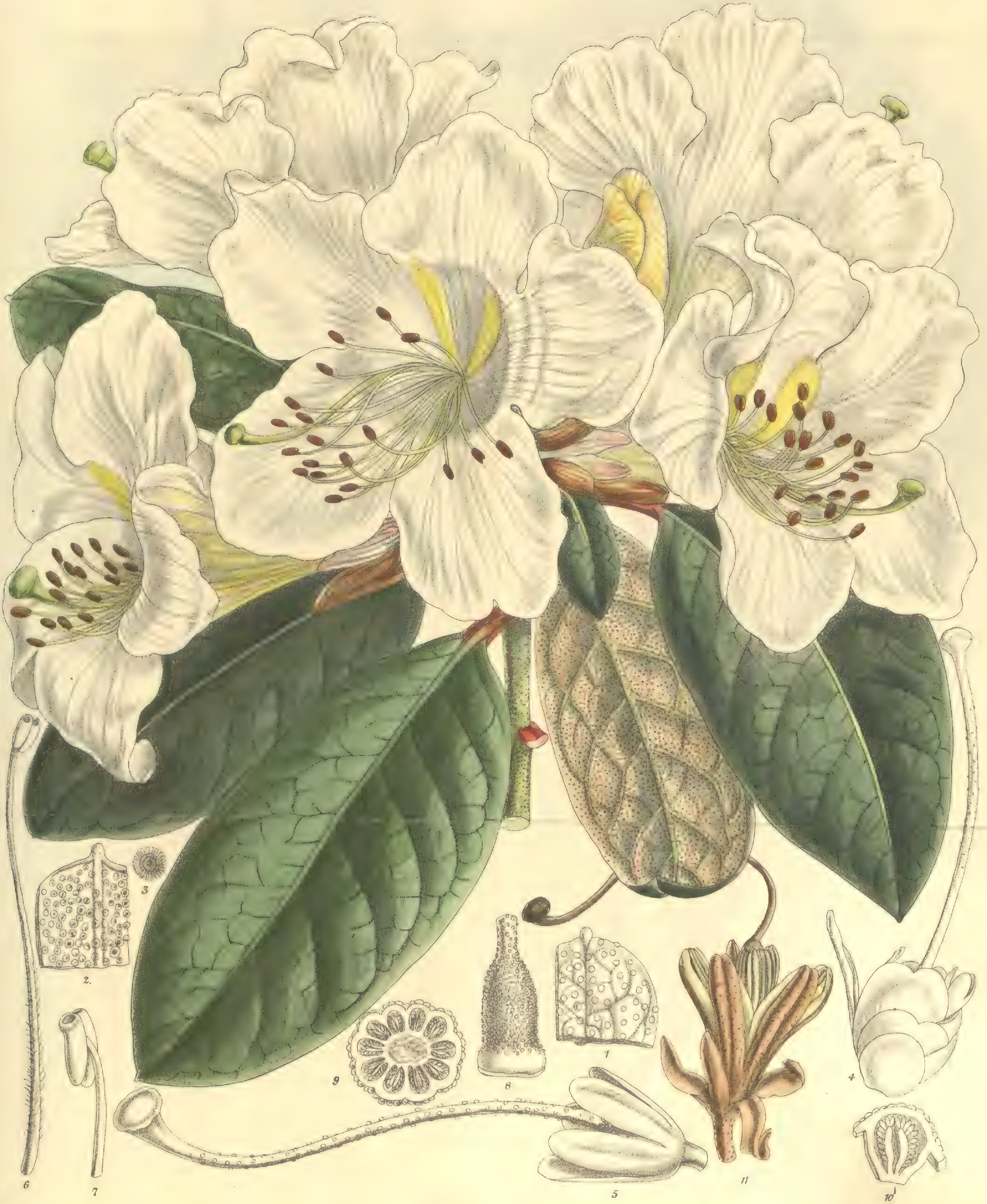
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TAB. 8212.

RHODODENDRON MADDENI, var. OBTUSIFOLIA.

Assam.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (§ Eurhododendron) **Maddeni,** *Hook. f. Rhod. Sikkim Himal.* 1849, t. 18; *Bot. Mag.* t. 4805; *Fl. Brit. Ind.* vol. iii. p. 472, var. **obtusifolia,** *Hutchinson*; a typo foliis obtusis basi rotundatis et calycis segmentis longioribus recedit.

Frutex robustus, 1–3 m. altus, ramulis pedicellis petiolis foliisque subtus ferrugineo-lepidotis. *Folia* elliptica vel oblongo-elliptica, 7–12 cm. longa, 3·5–5·5 cm. lata, utrinque obtusa, supra nitida, subtus glauca, nervis lateralibus utrinque 7–9 conspicuis; petioli 1–2 cm. longi. *Pedicelli* crassi, usque ad 1 cm. longi. *Calycis segmenta* oblonga, circiter 1·5 cm. longa et 5 mm. lata, obtusa, extus parce lepidota. *Corolla* alba, circiter 10 cm. diametro; tubus campanulatus 2–3·5 cm. longus, fauce circiter 3 cm. diametro, extra lepidotus, lobis 4–4·5 cm. longis 2·5–3·5 cm. latis apice rotundatis. *Stamina* 10; filamenta infra medium pilosa, antheris exsertis 5 mm. longis. *Ovarium* oblongum, 1 cm. longum, 0·5 cm. diametro; stylus lepidotus, 6–7 cm. longus, stigmate capitato. *Capsula* oblonga, 2 cm. longa.

The *Rhododendron* here figured was first collected by Sir George Watt in the mountains of north-east Manipur, on the eastern frontier of India, and it is undoubtedly one of the finest forms of the genus. It differs from typical *R. Maddeni* (B. M. t. 4805) in having much longer calyx segments and obtuse leaves, which are somewhat rounded at both ends. It is treated, therefore, as an eastern form of this species, which has so far only been recorded from Sikkim and Bhotan. It also resembles *R. Dalhousiae*, Hook. f., the calyx segments of which, however, are much broader and are usually ciliated.

DESCRIPTION.—*Shrub*, 3–10 ft. high, robust. *Branchlets*, pedicels, petioles, and the under surface of the leaves covered with brown scales. *Leaves* elliptic or oblong-elliptic, 2¾–4½ in. long, 1½–2¼ in. broad, obtuse at both ends, shining above, glaucous below, lateral nerves 7–9 on each side of the midrib, conspicuous; petioles ⅓–¾ in. long, stout. *Pedicels* stout, nearly ½ in. long. *Calyx-segments* oblong, obtuse, about ½ in. long and ¼ in. broad, lepidote on the outside. *Corolla* white, about 3½ in. in diameter; tube campanulate, ¾–1½ in. long, about 1¼ in. in diameter at the throat, lepidote on the outside, lobes 1½–1¾ in. long, 1–1½ in. broad, apex rounded. *Stamens* 10; filaments pilose below the middle, anthers exserted, ¼ in. long. *Ovary* oblong, ⅓ in. long, ¼ in. in diameter. *Style* lepidote, 2½–3 in. long, persistent, stigma capitate. *Capsule* oblong, ¾ in. long.—J. HUTCHINSON.

CULTIVATION.—*Rhododendron Maddeni*, var. *obtusifolia*, was raised from seeds forwarded to Kew in 1882 by Sir George Watt, who collected them in Manipur during the Demarcation Commission of 1881–2. The plant figured has been grown under glass, and is now planted in a border in the Himalayan House, where it has formed a well-furnished bush about 10 ft. high. It differs in habit and several other characters from the Himalayan *R. Maddeni* as represented in gardens. It has not been tried out of doors at Kew, where *R. Maddeni* is not hardy, but judging by its behaviour in the Himalayan House the treatment that answers for the majority of the Himalayan species of the genus, including *R. Maddeni*, will suit the plant now figured.—W. WATSON.

Fig. 1, portion of upper surface of leaf; 2, portion of under surface of leaf; 3, scale from under surface of leaf; 4, bracts and pistil; 5, calyx and pistil; 6, stamen; 7, anther; 8, ovary; 9, section of ovary; 10, one cell of same; 11, capsule:—*all enlarged.*

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TAB. 8213.

ROBINIA KELSEYI.

North America.

LEGUMINOSAE. Tribe GALEGEAE.

ROBINIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 499.

Robinia Kelseyi, *Hort., ex Cowell in Bail. Cycl. Am. Hort.* vol. iv. 1902, p. 1538; affinis *R. hispidae*, Linn., a qua foliolis angustioribus et floribus minoribus differt.

Frutex 1–3 m. altus, ramis divaricatis flexuosis glabris. *Folia* pinnata, petiolo communi usque ad 15 cm. longo subglabro supra leviter canaliculato, stipulis subulatis pilosis; foliola 4- vel 5-juga, oblongo-lanceolata, subacuta vel breviter apiculata, basi magis minusve rotundata, 2–4 cm. longa, 1–1·5 cm. lata, venis utrinque 4–5 supra indistinctis subtus prominulis; petioli 2–3 mm. longi, stipellis subulatis 2 mm. longis. *Racemi* 5–8-flori, usque ad 8 cm. longi, rhachi glanduloso-pilosa; pedicelli 4–5 mm. longi. *Calycis tubus* campanulatus, 5 mm. longus, extra glanduloso-pilosus, dentibus subaequalibus triangulari-subulatis acutissimis usque ad 8 mm. longis. *Corolla* rosea. *Vexillum* erectum, rotundatum, apice leviter bifidum, fere 2·5 cm. diametro, ungue 4 mm. longo. *Alae* oblongo-ellipticae, 2 cm. longae, 1 cm. latae, unguibus circiter 7 mm. longis. *Carina* circiter 1 cm. longa, ungue 7 mm. longo. *Tubus staminalis* 1·5 cm. longus, glaber. *Ovarium* leviter complanatum, glandulis rubris; stylus recurvatus, apicem versus villosus, stigmate subcapitato. *Legumen* oblongum, acutum, 4–5 cm. longum, dense glanduloso-pilosum. *Semina* 3–4, funiculo 1 mm. longo.

Robinia Kelseyi, like most other species of the genus, is highly ornamental; it is very similar in habit to *R. viscosa*, Vent., var. *macrophylla*, the flowers being of the same colour, but smaller. The only reference we have found to this hitherto imperfectly described species is in the publication cited above, where it is stated that *R. Kelseyi* is a new species discovered and introduced in 1901 by Mr. Harlan P. Kelsey; that the bark much resembles that of *R. Pseudacacia*; that the plant is sparingly pubescent; and that it is a compact shrub of distinctive habit.

DESCRIPTION.—*Shrub*, 3–10 ft. high, spreading. *Branches* glabrous. *Leaves* pinnate; common petiole usually 4–6 in. long, nearly glabrous, with a small groove on the upper side; stipules subulate, pilose; leaflets in 4–5 pairs, oblong-

SEPTEMBER, 1908.

lanceolate, subacute or shortly apiculate, more or less rounded at the base, $\frac{1}{2}$–$1\frac{1}{2}$ in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. broad; lateral nerves 4–5, prominent below; petiolules about $\frac{1}{12}$ in. long; stipels subulate, $\frac{1}{12}$ in. long. *Racemes* 5–8-flowered, up to $3\frac{1}{2}$ in. long, rhachis glandular-pilose; pedicels $\frac{1}{6}$ in. long. *Calyx-tube* campanulate, $\frac{1}{6}$ in. long, glandular-pilose on the outside, teeth 5 or 6, subequal, triangular-subulate, very acute, about $\frac{1}{4}$ in. long. *Corolla* rose-coloured; standard erect, rounded, about an inch in diameter, claw $\frac{1}{6}$ in. long; wing-petals oblong-elliptic, $1\frac{1}{4}$ in. long, $\frac{1}{3}$ in. broad, claw about $\frac{1}{4}$ in. long; keel-petals $\frac{1}{3}$ in. long, claw $\frac{1}{4}$ in. long. *Staminal-tube* glabrous. *Ovary* slightly flattened, with red glandular hairs; style recurved, stigma subcapitate. *Pod* oblong, acute, $1\frac{1}{2}$–2 in. long, densely clothed with glandular hairs. *Seeds* 3–4, funicle very short.—J. HUTCHINSON.

CULTIVATION.—*Robinia Kelseyi* was purchased for the Kew collection from Mr. H. P. Kelsey of Boston, Mass., U.S.A., in the spring of 1903. Although its affinity with *R. hispida* is apparent, it is quite distinct in habit and appearance. At present it seems likely to form a small tree, and has not the rank growth of *R. hispida*, which renders that species so liable to injury by wind. It flowers regularly in early or mid-June, and is then a most attractive object, the shoots of the previous year being covered with numerous short racemes of rose-coloured flowers. Its fruits also are ornamental. In June last a specimen in the Fruticetum of Mr. Maurice de Vilmorin at Les Barres in France was quite striking from the number of seed-pods it carried, each densely covered with reddish bristles. Propagation can be effected by grafting on the roots of *R. Pseudacacia*.—W. J. BEAN.

Fig. 1, part of a mature leaf; 2, stipules; 3, calyx laid open, with stamens and pistil; 4, pistil; 5, pods; 6, glandular hairs of pod:—2–4 *and* 6 *enlarged.*

8214.

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AGAVE Watsoni.

Central America?

Amaryllidaceae. Tribe Agaveae.

Agave, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 733.

Agave (§ Littaea) **Watsoni,** *J. R. Drummond et C. H. Wright, in Kew Bull.* 1907, p. 322; species *A. expatriatae*, J. N. Rose, maxime affinis, a qua inflorescentia breviore sed latiore, foliorum pagina superiore vix concava et spinis marginalibus minoribus parum uncinatis differt.

Caulis perbrevis. *Folia* 15–20 densius rosulata, laete viridia; exteriora sub anthesin patentia, anguste oblongo-lanceolata, circa 50 cm. longa, basi tumescente 8 mm. crassa ibique 9·5 cm. lata, cervice facie superiore convexa 5·5 cm. lata, inde facie superiore fere plana, versus apicem gradatim expansa medioque 7·5 cm. lata; interiora erecta, angustiora, in bracteas sensim abeuntia; omnia vitta marginali castanea tandem cinerascente ornata, marginibus aculeis circiter 5 mm. longis basi compressis vix uncinatis inter se 2 cm. remotis apiceque spina obtusiuscula 1·8 cm. longa armata. *Scapus* fere 2·5 m. altus, ad basin 3·5 cm., sub spicam floriferam 2 cm. crassus, cylindricus, bracteis imis exceptis patentibus subtiliter sulcatis albidis instructus. *Flores* viridescentes, staminibus purpurascentibus, in spicam densiorem fere 10 cm. latam aggregati. *Bracteae* inter alabastra inconspicuae, vix 1 cm. longae, supra basin abrupte constrictae, conduplicatae, in setas firmas subulatas scariosas abeuntes. *Ovarium* inferum 13–14 mm. longum, 5 mm. latum, subtriquetrum. *Perianthii tubus* supra ovarium abrupte constrictus, manifeste 6-sulcatus; *lobi* ovario aequilongi, subcarnosi, viridescentes, marginibus albido-pellucidi. *Stylus* robustior, 3·5 cm. longus, albido-pellucidus, purpurascens; stigma papillosum.

The *Agave* here figured flowered at Kew in the spring of 1907. As regards inflorescence it is nearest to *A. densiflora*, Hook. (B. M. t. 5006), which has also somewhat the same type of leaf, but with different, far more closely set margin-prickles; the apple-green leaf, with an almost convex neck, and flat upper surface of the blade, resembling that of *A.* (*Euagave*) *decipiens*, Baker, should serve to distinguish *A. Watsoni* from all known *Littaeae*, not excluding *A. expatriata*, Rose, which is only known to us from the author's photograph and description.

Description.—*Stem* very short. *Leaves* apple-green, 15–20 in a moderately dense rosette, the outer, at the time of flowering, spreading, narrowly oblong-lanceolate, about 20 in. long, dilated base over $\frac{1}{3}$ in. thick, and $3\frac{3}{4}$ in. broad, neck about $2\frac{1}{4}$ in. broad, convex on its upper surface, greatest width of leaf, at about 9 in. from the base, about 3 in., upper surface almost flat upwards, except just below the tip, which bears a rather blunt, finely grooved spine, less than $\frac{3}{4}$ in. long; margins with an extremely narrow ribbon, brown when young, ashen grey with age, armed at intervals of about $\frac{3}{4}$ in. with prickles under $\frac{1}{4}$ in. long, compressed at their bases, narrowly triangular in outline, tips not obviously hooked. *Flowering stem* not quite 9 ft. high, diameter $1\frac{1}{3}$ in. at the base, less than an inch just below the spike of greenish flowers, with purplish filaments and anthers, which before withering give the spike a diameter of a little less than four inches. *Bracts* suddenly narrowed above their bases and folded into a firm, awl-shaped scarious bristle, whitish and conspicuous on the scape, but hidden by the buds and blossoms. *Ovary* rather more than $\frac{1}{2}$ in. long by $\frac{1}{5}$ in. broad; tube sharply constricted, plainly six-furrowed. *Perianth-lobes* about the same length as the germen, rather fleshy, green with white translucent edges; style robust, suffused with purple; stigma papillose. —J. R. DRUMMOND.

CULTIVATION.—*Agave Watsoni* was purchased in 1906 from Mr. Justus Corderoy, Blewbury, Didcot, who obtained it originally from the Ghiesbreght Collection as an unnamed species. It flowered at Kew in 1907 under the usual conditions of cultivation. Unless there are other plants of it elsewhere it is likely to be lost to cultivation, as it has produced neither seeds nor offsets.—W. WATSON.

Figs. 1 and 2, anthers; 3, style apex; 4, whole plant:—1–3 *enlarged*, 4 *reduced*.

8215

[illegible]

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TAB. 8215.

ZALUZIANSKYA MARITIMA.

South Africa.

SCROPHULARIACEAE. Tribe MANULEAE.

ZALUZIANSKYA, *F. W. Schmidt*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 944 (*Zaluzianskia*); *Hiern in Dyer, Fl. Cap.* vol. iv. sect. 2, p. 333.

Zaluzianskya maritima, *Walp. Rep.* vol. iii. p. 307; *Hiern*, l.c. p. 335; *Gumbleton in Gard. Chron.* 1907, vol. xlii. p. 161, fig. 64; species *Z. lychnideae*, Walp., simillima, sed robustior, foliis latioribus trinerviis, floribus majoribus et limbi lobis saepe latioribus differt.

Herba perennis siccitate nigricans. *Caulis* erectus, decumbens vel adscendens, basi saepe paulum suffruticosus, simplex vel parce ramosus, sat dense foliosus, pubescens vel puberulus, 15 cm.–1 m. altus. *Folia* tenuiter coriacea, obtusa, glabra vel puberula, saepius trinervia, integerrima vel remote denticulata; inferiora subsessilia vel breviter petiolata, basin versus valde angustata, anguste elliptica, obovato-oblonga vel lanceolato-oblonga, 2·5–7 cm. longa, 6 mm.–2 cm. lata; superiora sessilia, sensim minora, saepe adpressa; floralia sessilia, amplexicaulia, late lanceolata, 1–2·5 cm. longa. *Spicae* elongatae, sat dense floriferae. *Calyx* tubulosus, 1 1·5 cm. longus, profunde bilabiatus, pubescens vel ciliolatus; dentes parvi, ovato-deltoidei vel ovato-lanceolati, obtusi. *Corolla* marcescens, extra glanduloso-puberula, saturate rubra vel purpureo-brunnea, intus vivide alba, interdum limbi lobis roseo-marginatis; tubus gracillimus, 3·5–5 cm. longus; limbus patens, 5-partitus, 12–18 mm. diametro, lobis obovatis bifidis. *Stamina* glabra, 2 longiora paulum exserta. *Stylus* filiformis, exsertus. *Capsula* coriacea, oblonga, 10–12 mm. longa.—*Erinus maritimus*, Linn. f. Suppl. p. 287. *Nycterinia maritima*, Benth. in Hook. Comp. Bot. Mag. vol. i. p. 369, et in DC. Prodr. vol. x. p. 348. *N. coriacea*, Benth., ll.cc. *N. spathacea*, Benth., ll.cc. *Zaluzianskya coriacea* et *Z. spathacea*, Walp. Rep. vol. iii. p. 306. *N. natalensis*, Bernhardi ex Krauss in Flora, 1844, p. 834; Harv. Thes. Cap. vol. i. p. 37, t. 58. *Z. natalensis*, Bernhardi, l.c.

Mr. Hiern's monograph of *Zaluzianskya* in the Flora Capensis includes 32 species, all of which are confined to South Africa. The difficulty of distinguishing some of them is considerable, and it is questionable whether all are really distinct. Bentham suggested that the plant here figured might be only a variety of *Z. lychnidea*, which, as *Erinus lychnidea*, is depicted at t. 2504 of this work, and Mr. Hiern suspects the identity of *Z. lychnidea* and *Z. capensis*, Walp. Both are recorded as being in cultivation,

SEPTEMBER, 1908.

the former as long ago as 1823, while *Z. selaginoides*, Walp. (= *Z. villosa*, F. W. Schmidt) also finds a place in some of our horticultural dictionaries. It is probable that they soon disappeared, for like many Scrophulariaceae with strikingly attractive flowers the species of *Zaluzianskya* do not appear to thrive for long when removed from their native environment. The flowers of *Z. maritima*, as in other species of the genus, open only in the evening or in dull weather. When expanded they are very fragrant.

Z. maritima is widely spread in South Africa, and is met with at a low level near the sea as well as far inland at elevations up to 4,000 ft. or more. Mr. Hiern records five varieties, one of which (var. *grandiflora*, Hiern) has the limb of the corolla as much as an inch across.

DESCRIPTION.—*Herb*, perennial. *Stem* erect, decumbent or ascending, often slightly shrubby at the base, simple or sparingly branched, rather densely leafy, pubescent or puberulous, ½–3 ft. high. *Leaves* thinly coriaceous, obtuse, glabrous or puberulous, usually 3-nerved, quite entire or remotely toothed; lower subsessile or shortly stalked, very much narrowed towards the base, narrowly elliptic, obovate-oblong or lanceolate-oblong, 1–3 in. long, ¼–¾ in. broad; upper sessile, gradually becoming smaller, often adpressed; floral-leaves sessile, amplexicaul, broadly lanceolate, ½–1 in. long. *Spikes* elongated, rather densely flowered. *Calyx* tubular, ½–⅔ in. long, deeply 2-lipped, pubescent or slightly ciliate; teeth small, ovate-deltoid or ovate-lanceolate, obtuse. *Corolla* marcescent, glandular-puberulous and deep red or purple-brown outside, shining white inside, or the lobes of the limb sometimes bordered with rose; tube very slender, 1½–2 in. long; limb spreading, 5-cleft, ½–¾ in. across; lobes obovate, bifid. *Stamens* 4, glabrous, the 2 longer slightly exserted. *Style* filiform, exserted. *Capsule* coriaceous, oblong, about ½ in. long.—S. A. SKAN.

CULTIVATION.—This *Zaluzianskya* was presented to Kew by Mr. W. E. Gumbleton, who raised plants of it from seeds obtained by him from Mr. Thorncroft of Barberton. It has behaved here as an annual, for plants tried in the herbaceous department, as well as others grown in the Cape

House, died after flowering; they also failed to produce seeds. The treatment most suitable for such half-hardy annuals from South Africa as *Rhodanthe*, *Diascia*, and *Nemesia* would probably also suit this *Zaluzianskya.*—W. WATSON.

Fig. 1, longitudinal section of flower; 2, longitudinal section of upper part of corolla-tube, showing stamens; 3, upper portion of style:—*all enlarged.*

8216

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TAB. 8216.

BULBOPHYLLUM GALBINUM.

Malay Peninsula.

ORCHIDACEAE. Tribe EPIDENDREAE.

BULBOPHYLLUM, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 501 *Pfitzer in Engl. et Prantl, Pflanzenfam.* vol. ii. 6, p. 286.

Bulbophyllum galbinum, *Ridl. in Journ. Linn. Soc.* vol. xxxii. p. 267; *Materials Fl. Mal. Penins.* part 1, p. 64; *Gard. Chron.* 1907, vol. xlii. p. 42. fig. 14; habitu *B. Reinwardtii*, Reichb. f., pedunculis bifloris differt.

Herba epiphytica. *Rhizoma* longe repens, validum. *Pseudobulbi* 9–11 cm. distantes, anguste oblongi, subcompressi, 5–8 cm. longi, vaginis membranaceis acutis tecti, monophylli. *Folia* petiolata, oblonga vel elliptica, acuta, coriacea, 12–20 cm. longa, 4–7 cm. lata; petioli 2-3 cm. longi, canaliculati. *Scapi* 12–22 cm. longi, graciles, 2-flori. *Flores* magni, speciosi, explanati, olivaceo-flavi, sepalis purpureo-punctatis, petalis purpureo-striatis, labello purpureo. *Bracteae* ovatae, acutae, circa 2 cm. longae. *Pedicelli* circa 2·5 cm. longi. *Sepalum* posticum late lanceolatum, acuminatum, 4–5 cm. longum; lateralia basi late triangulari-ovata, dein longe caudato-acuminata, 4–4·5 cm. longa, basi 1·5 cm. lata. *Petala* basi ovata, longe acuminata, apice setacea, 2·5 cm. longa. *Labellum* longe unguiculatum, cordatum, acuminatum, carnosum, apice recurvum, basi subconcavum, 1·5 cm. latum. *Columna* lata, 8 mm. longa, dentibus brevibus angulatis subobtusis.

Bulbophyllum galbinum is a native of the Malay Peninsula, and was described about twelve years ago by Mr. Ridley, Director of the Singapore Botanic Garden, from materials collected on Maxwell's Hill, Perak, where it is said to be abundant, climbing on trees in dense jungle. It was compared with *B. Reinwardtii*, Reichb. f., to which it bears a general resemblance in habit, though it is readily distinguished by its two-flowered peduncle. It had previously flowered at the Royal Botanic Garden, Glasnevin, and was at first referred to *B. Reinwardtii.* Mr. J. J. Smith refers (Orch. Java, p. 443) both *B. Reinwardtii*, Reichb. f., and *B. galbinum*, Ridl., to *B. uniflorum*, Hassk., though the one now figured does not at all answer to the name, and several species of the section *Sestochilos* are persistently 1-flowered. Whether *B. Reinwardtii* be in cultivation is doubtful, though Reinwardt's original drawing and a dried specimen collected by Thomas Lobb, in Java, which Lindley considered identical, are preserved in the Herbarium of the latter, now at Kew. Micholitz also collected plants apparently of the same species in Sumatra, and carefully noted the peduncles as being 1-flowered, and all the four present are in this condition. Having regard to these facts it is difficult to regard all these forms as one species, and the species of this affinity certainly require careful revision from living specimens, or at all events from more complete material than is yet available.

DESCRIPTION.—*Herb*, epiphytic, with stout, long-creeping rhizome. *Pseudobulbs* $3\frac{1}{2}$–$4\frac{1}{2}$ in. apart, narrowly oblong, somewhat compressed, 2–$3\frac{1}{4}$ in. long, covered with membranous acute sheaths, 1-leaved. *Leaves* petioled, oblong or elliptical, acute, coriaceous, $4\frac{1}{2}$–8 in. long, 1–$2\frac{3}{4}$ in. broad; petioles $\frac{3}{4}$–$1\frac{1}{4}$ in. long, channelled. *Scapes* 5–8 in. long, slender, 2-flowered. *Flowers* large, open, greenish-yellow, the sepals dotted and the petals striped with purple-brown, and the lip purple. *Bracts* ovate, acute, about $\frac{3}{4}$ in. long. *Pedicels* about 1 in. long. *Sepals* spreading; dorsal broadly lanceolate, acuminate, nearly 2 in. long; lateral with broadly triangular-ovate base, caudate-acuminate above the middle, about 2 in. long, over $\frac{1}{2}$ in. broad at the base. *Petals* with broadly-ovate base, setaceous-acuminate above, about 1 in. long. *Lip* long unguiculate, cordate, acuminate, fleshy, with recurved apex, and somewhat concave base, nearly $\frac{3}{4}$ in. long. *Column* broad, $\frac{1}{3}$ in. long.—R. A. ROLFE.

CULTIVATION.—*Bulbophyllum galbinum* was presented to Kew by the Hon. Walter Rothschild along with other orchids, including *B. Ericssonii*, *B. virescens* and *B. Binnendijkii*. These four resemble each other closely in habit; consequently they are treated alike under cultivation. *B. Binnendijkii* was figured at t. 8187 of this work, and the cultural directions there given may be followed for *B. galbinum*, which flowered at Kew in May this year. —W. WATSON.

Fig. 1, column, with its foot, and the lip; 2, whole plant: 1 *enlarged*, 2 *much reduced*.

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CONTENTS OF No. 45, SEPTEMBER, 1908.

Tab. 8212.—RHODODENDRON MADDENI, var. OBTUSIFOLIA.
„ 8213.—ROBINIA KELSEYI.
„ 8214.—AGAVE WATSONI.
„ 8215.—ZALUZIANSKYA MARITIMA.
„ 8216.—BULBOPHYLLUM GALBINUM.

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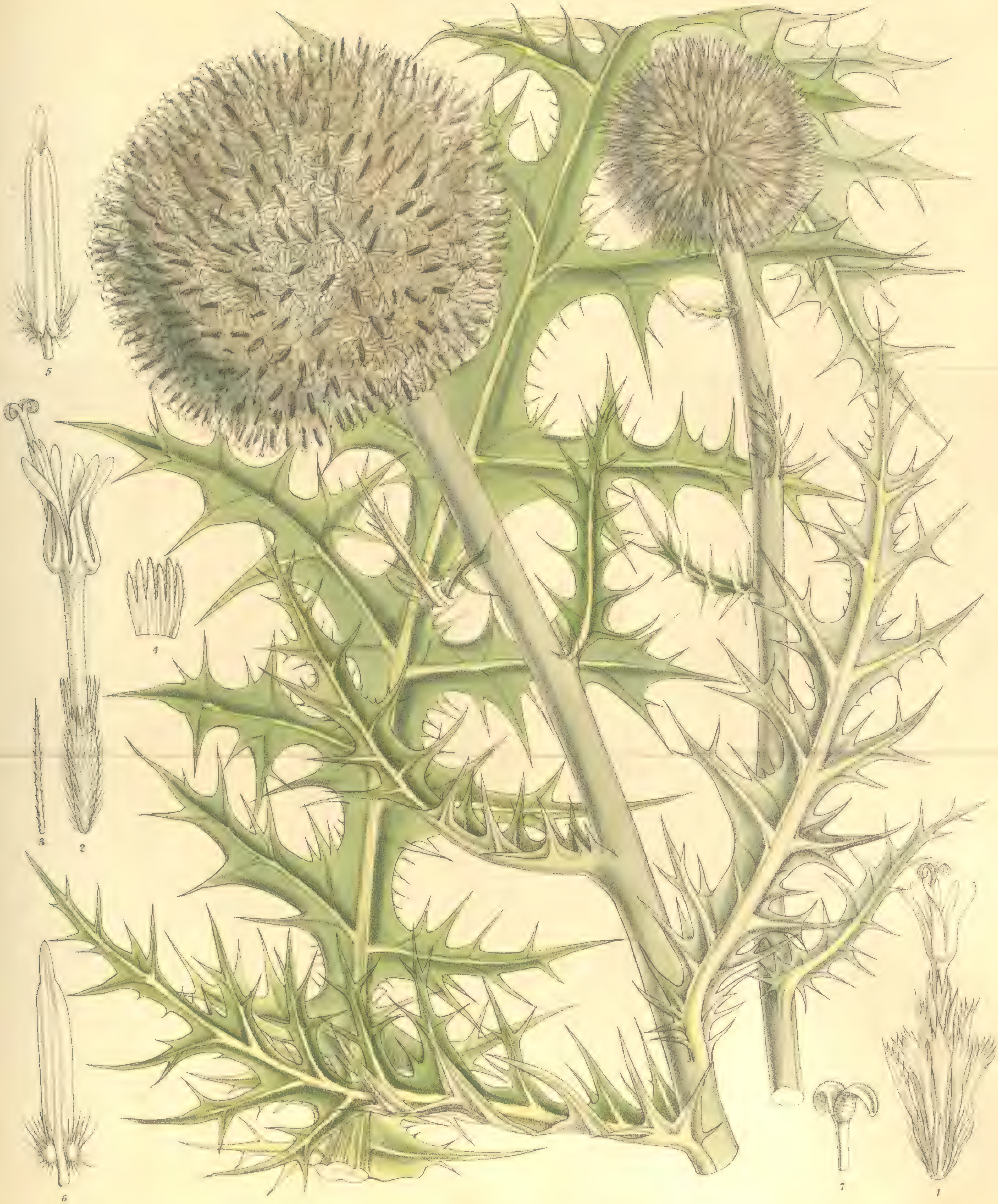

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TAB. 8217.

ECHINOPS TOURNEFORTII.

Armenia and Persia.

COMPOSITAE. Tribe CYNAROIDEAE.

ECHINOPS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 462; *Boiss. Fl. Or.* vol. iii. p. 423.

Echinops Tournefortii, *Ledeb. in Trautv. Diss. de Echinope*, cap. 2 (1833), p. 21, f. 7; *Jaub. et Spach, Ill. Pl. Or.* vol. v. t. 427; *Boiss. Fl. Or.* vol. iii. p. 438; *Mott. in Rev. Hort.* 1906, p. 523, f. 200; species e grege *Ritro* capituli compositi magnitudine insignis.

Herba perennis, spinosissima, caule pauciramoso usque ad 1·5 m. alto. *Folia* ampla, pinnatisecta, inferiora tripinnatisecta, 30–40 cm. longa, caulina sursum sensim minora et minus secta, omnia segmentis ultimis valide spinosa, supra scaberula, subtus cano-tomentosa. *Capitula* uniflora, numerosissima, in glomerulos globosos capituliformes amplos (interdum usque ad 12–15 cm. diametro sed saepius dimidio minores) terminales longe pedunculatos aggregata. *Bracteae* involucri communis numerosae, setiformes et cochleariformes, arcte reflexae, breves, capitulis absconditae. *Bracteae* involucrorum partialium numerosissimae, introrsum gradatim majores, omnes inter se liberae, trimorphae, scilicet: exteriores setiformes, pappiformes, intermediae cochleariformes vel spathulatae, apice ciliatae vel setulosae, interiores rigidiores, lanceolatae, longe acuminatae, pungentes, margine setuloso-ciliatae, flores fere aequantes. *Flores* omnes tubulosi, hermaphroditi, circiter 3 cm. longi, pallide lilacini, antheris caerulei vel fere nigri. *Corolla* regularis, tubo tenui; limbus alte 5-lobatus, lobis linearibus obtusiusculis reflexis. *Antherae* exsertae, basi barbatae. *Achaenia* setulis longis rectis arcte appressis per totam longitudinem densissime vestita; pappi paleae 5, squamiformes, fimbrillatae.—*Echinopus orientalis Acanthi aculeati folio capite magno spinoso coeruleo*, Tournef. Inst. Rei Herb., Coroll. p. 34, fide Jaubert et Spach, Ill. Pl. Or. vol. v. ad t. 427.

This is perhaps the handsomest of the Globe Thistles in cultivation. It was originally described from cultivated plants raised in the Dorpat Botanic Gardens from seed collected on Mount Ararat, and Kew possesses what may be considered a type specimen, communicated by Ledebour to the late Sir William Hooker. The one flower-head is larger than any other we have seen of this species, being, as flattened out, 6 in. across. Incidentally it may be mentioned here that the apparent flower-heads are agglomerations of one-flowered capitula, each invested by an elaborate involucre of bristles and bracts.

OCTOBER, 1908.

Echinops is a genus of upwards of seventy species, ranging from Europe and North Africa, across Asia to China and Japan, and a few species are peculiar to the mountains of Tropical Africa. The European, Asiatic and North African species present no striking contrasts, and have either white or blue flowers; but some of the Tropical African species are very different from each other and from the rest of the genus. Thus *E. amplexicaulis*, Oliv., has pink or crimson flowers; *E. giganteus*, A. Rich., grows as much as 16 ft. high, and *E. chamaecephalus*, Hochst., is almost stemless with huge solitary heads of flowers.

The process of the dispersal of the pollen of *Echinops* is the same as in *Centaurea*. It is discharged into the cylinder formed by the connate anthers before the expansion of the corolla and the elongating style pushes some of it out at the top, whilst the rest is ejected by a sudden contraction of the filaments, which pulls the anthers down. But the female stage, the divergence of the style-arms, sometimes follows so quickly in *E. Tournefortii*, that self-fertilisation seems possible.

DESCRIPTION.—*Perennial*, from 3–5 ft. high. *Leaves* large, pinnately divided, lower ones tripinnate, 1 to 1½ ft. long, gradually smaller and less divided upwards, ultimate lobes ending in strong spines, slightly rough on the upper surface, clothed with a white felt beneath. *Flower-heads* few, globose, 2½–3 in. or sometimes as much as 5 in. in diameter, terminal on long stalks, each flower surrounded by an involucre of bristles and sharp-pointed bracts. *Corolla* white, tubular, slightly overtopping the bracts; limb 5-parted; lobes linear, reflexed. *Anthers* exserted, blue. *Achenes* densely clothed with long, straight, coarse hairs. *Pappus* of five small scales, concealed by the hairs. —W. BOTTING HEMSLEY.

CULTIVATION.—*Echinops Tournefortii* grows freely and flowers in August along with the other Globe Thistles and appears to be quite as hardy as any of them. It came originally from Canon Ellacombe's garden at Bitton, where the plant figured was grown in 1906.—W. WATSON.

Fig. 1, a flower-head of one flower; 2, a flower; 3 and 4, pappus; 5 and 6, anthers; 7, style-arms:—*all enlarged.*

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TAB. 8218.

ROSA SERICEA, var. PTERACANTHA.

Western China and Manipur.

ROSACEAE. Tribe ROSEAE.

ROSA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa (§ Caninae) **sericea**, *Lindl.*, var. **pteracantha**, *Franch. Plant. Delavay.* pars i. 1889, p. 220; *Gard. Chron.* 1905, vol. xxxviii. p. 260, figs. 98 et 99; a typo aculeis ramorum compressis basi valde dilatatis confluentibus recedit.

Frutex robustus, ramosus, circiter 3 m. diametro. *Rami* saepius dense setulosi, aculeis magnis rubris compressis decurrentibus basi elongatis 2–4 cm. longis armati. *Folia* viridia, 9–13-foliolata, usque ad 7 cm. longa; foliola elliptico- vel obovato-oblonga, 1–1·5 cm. longa, 5–7 mm. lata, serrata, glabra; rhachis parce aculeolata. *Stipulae* angustatae, adnatae, circiter 1 cm. longae, glabrae, parte libera acuta. *Flores* in ramis brevibus lateralibus solitarii, albi, 4–5 cm. diametro; pedunculi breves, glabri. *Receptaculum* glabrum, obconicum. *Calycis lobi* ovato-lanceolati, circiter 1 cm. longi, basi 3 mm. lati, acuti, apicem versus paucidentati, extra parce intus densius sericei. *Petala* saepius 4, obovata, emarginata. *Carpella* pilosa. *Fructus* subglobosus, ultra 1 cm. diametro, saturate ruber.

Rosa sericea, var. *pteracantha*, occurs in company with the typical form which is abundant at elevations of from 3,000–11,000 ft. Of the Indian specimens which represent the true species at Kew, only those collected in Manipur by Sir George Watt have prickles as large as in this Chinese variety, though it is understood that occasionally shoots with broad prickles are to be met with in the Eastern Himalaya.

The plant here figured differs from that described by Franchet in having glabrous leaves, but the specimens at Kew show intermediate forms which link the two. The stems are sometimes devoid of the setulose bristles which accompany the remarkably large, red, translucent prickles; and the latter are often absent from the branches which bear the flowers.

DESCRIPTION.—*Shrub*, robust, much branched, forming a bush as much as 10 ft. in diameter. *Branches* often densely setulose; prickles large, red, compressed, decurrent, elongated

OCTOBER, 1908.

at the base, $\frac{3}{4}$–1$\frac{1}{2}$ in. long. *Leaves* green, the largest about 2$\frac{3}{4}$ in. long; leaflets 9–13, elliptic-oblong or obovate-oblong, $\frac{1}{3}$–$\frac{1}{2}$ in. long, $\frac{1}{6}$–$\frac{1}{4}$ in. broad, serrate, glabrous, axis usually furnished with a few small prickles. *Stipules* narrow, adnate, nearly $\frac{1}{2}$ in. long, glabrous. *Flowers* solitary, white, terminating short, lateral branches, 1$\frac{1}{2}$–2 in. across. *Peduncles* short and glabrous. *Receptacle* glabrous, obconic. *Calyx-lobes* ovate-lanceolate, about $\frac{1}{3}$ in. long, $\frac{1}{8}$ in. broad at the base, acute, dentate towards the apex, outside sparingly, inside more densely silky. *Petals* usually 4, obovate, emarginate. *Fruit* subglobose, a little over $\frac{1}{2}$ in. in diameter, bright red.—J. HUTCHINSON.

CULTIVATION.—Hitherto Roses have been grown in gardens chiefly for the beauty and fragrance of their flowers and for their fruits, but in this new Chinese variety the large, beautifully coloured prickles provide a new and additional source of attraction. They constitute the most striking feature of the variety, for the flowers are not so large as in the typical *R. sericea.* The plant from which our figure was made was purchased from Messrs. Paul of Cheshunt in 1906, but European gardens owe its first introduction to Mr. Maurice L. de Vilmorin, in whose Fruticetum at Les Barres it has for some years been the most remarkable of a numerous series of Chinese forms of *R. sericea.* Like Roses in general this needs a good strong soil to bring out its full attractions; it should preferably be grown in a rich, rather stiff loam. The beauty of its prickles is most marked on strong vigorous shoots of the current year; the second year they become grey and woody.—W. J. BEAN.

Fig. 1, receptacle and calyx; 2 and 3, stamens; 4, carpel:—*all enlarged.*

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TAB. 8219.

ANISOTES DIVERSIFOLIUS.

Socotra.

ACANTHACEAE. Tribe JUSTICIEAE.

ANISOTES, *Nees*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1111; *C. B. Clarke in Dyer, Fl. Trop. Afr.* vol. v. p. 226.

Anisotes diversifolius, *Balf. fil. in Proc. Roy. Soc. Edinb.* vol. xii. 1884, p. 88; *Trans. Roy. Soc. Edinb.* vol. xxxi. p. 223; ab *A. trisulco*, Nees, foliis minus confertis et calyce extus tantum puberulo recedit.

Fruticulus erectus, glabrescens, circiter 0·5 m. altus, cortice griseo, ramulis striatis puberulis. *Folia* patentia. elliptica, ovata vel obovata, apice obtusa, rotundata vel emarginata, basi cuneata vel rotundata, 1·5–4 cm. longa, 1–2·5 cm. lata, tenuiter coriacea, glabrescentia, cystolithis numerosis in sicco prominentibus; petioli 0·5–2·5 cm. longi. *Cymae* breves, axillares, pauciflori, bracteis bracteolisque minimis. *Flores* penduli. *Calyx* 6 mm. longus, extra minute puberulus, segmentis erectis lineari-lanceolatis acutis. *Corolla* flammea vel citrina, 4–5 cm. longa, conspicue bilabiata, extus pubescens; tubus angustus, cylindricus; labium posticum leviter curvatum, breviter bilobatum, anticum revolutum, apice breviter trilobatum. *Stamina* 2, postica, labium posticum corollae subaequantia, filamentis complanatis venula media prominula; antherarum lobis aequalibus inaequialte affixis basi acutis. *Ovarium* glabrum, disco crasso cinctum; stylus minute puberulus, praesertim inferne. *Capsula* oblonga, stipitata, cum stipite vix 2 cm. longa.

Anisotes is a small genus allied to *Justicia*, and includes one Arabian and four Tropical African species in addition to the endemic Socotran *A. diversifolius*.

According to Balfour (*l.c.* p. xliii.), the family of *Acanthaceae* attains a remarkable development in Socotra, where it forms about one-twentieth part of the flora, comprising 27 species which are included in 15 genera. Three of the genera and 21 species are endemic, so that over one-seventh of the endemic genera of Socotra and one-tenth of the endemic species belong to the *Acanthaceae*.

The venation of the corolla in *Anisotes diversifolius* is peculiar: three veins start from the base of the corolla-tube, one corresponding to the lower lip and two to the upper, and the two latter each divide into three a short distance above the base as shown in fig. 3.

OCTOBER, 1908

DESCRIPTION.—*Shrub*, erect, glabrescent, about 1½ ft. high, with greyish bark and striate puberulous branchlets. *Leaves* elliptic-ovate or obovate, obtuse rounded or emarginate at the apex, wedge-shaped or rounded at the base, ¾–1¾ in. long, ½–1 in. broad, thinly coriaceous, becoming glabrous, conspicuously dotted with numerous large cystoliths in the dried state; petioles ¼–1 in. long. *Cymes* short, axillary, few-flowered; bracts and bracteoles minute. *Flowers* pendulous. *Calyx* ¼ in. long, minutely puberulous outside; segments linear-lanceolate, acute. *Corolla* flame-coloured or yellow, 1½–2 in. long, conspicuously two-lipped, pubescent outside; tube narrow, cylindric; upper lip slightly curved, lower revolute, slightly three-lobed at the tip. *Stamens* 2, nearly equalling the upper lip; filaments flattened, with a fairly prominent middle nerve; anther-lobes acute at the base, one attached higher than the other. *Ovary* glabrous, surrounded at the base by a thick disk; style minutely puberulous, especially in the lower part. *Capsule* oblong, stipitate, about ¾ in. long, including the stipe.—T. A. SPRAGUE.

CULTIVATION.—Kew is indebted to Colonel Beddome for a plant of this little shrub which grew about 18 in. high and flowered in April in a warm greenhouse, where it continued to develop flowers till July. It is similar in its habit and requirements to some species of *Justicia*, *Jacobinia* and *Peristrophe*, and as it agrees with these in being easy to propagate by means of cuttings it may well be grown along with them for conservatory decoration in spring. It also matures seeds under cultivation.—W. WATSON.

Fig. 1, calyx and style; 2, section of calyx; 3, part of corolla-tube; 4 and 5, anthers:—*all enlarged.*

8220

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TAB. 8220.

LEWISIA COTYLEDON.

North America.

PORTULACACEAE.

LEWISIA, *Pursh*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 159.

Lewisia Cotyledon, *Robinson in A. Gray Synop. Fl. N. Am.* vol. ii. p. 268; species *L. Tweedyi*, Robinson (B. M. t. 7633), proxima, differt pedunculis plurifloris, bracteis ciliatis et petalis contiguis.

Herba perennis, acaulis, praeter glandulas stipitatas glabra, caudice incrassato. *Folia* carnosa, rosulata, oblonga, oblanceolata vel spathulata, 4–6 cm. longa, margine primum glanduloso-ciliata. *Pedunculi* 10–12 cm. alti, 8–12-flori, bracteis ovato-oblongis circiter 1 cm. longis glanduloso-ciliatis infra flores instructi; pedicelli cymosi, 1–2 cm. longi, primum recurvi. *Flores* circiter 3·5 cm. diametro, albi, roseo lineati. *Sepala* 2, libera, truncata, apice fere 1 cm. diametro, glanduloso-ciliata, marginibus in alabastro late obtegentia, unum exterius, unum interius. *Petala* numero variabilia sed saepius 9 vel 10, spathulata, erosa, recurva. *Stamina* 7–10, petalis triente breviora; filamenta basi connata. *Ovarium* uniloculare, circiter 20-ovulatum; stylus stamina aequans, trifida.—*Calandrinia Cotyledon*, S. Wats. in Proc. Am. Acad. Sc. vol. xx. (1885), p. 355. *Oreobroma Cotyledon*, Howell in Erythea, vol. i. (1893), p. 32.

The delimitation of the genera *Lewisia* and *Calandrinia* is a subject as to which authors are by no means in agreement. Robinson in the place cited above extends *Lewisia*, and includes under it the *Oreobroma* of Howell, and he is followed here, as he was by Sir Joseph Hooker under t. 7633. But we are not convinced that this is a good solution of the difficulty. *Lewisia rediviva*, Pursh (B. M. t. 5395), the species on which the genus was founded, differs from the present plant in having usually seven sepals, numerous petals, indefinite stamens and about eight style-branches, and has perhaps valid claims to independent generic rank.

Lewisia Cotyledon is a very attractive plant; its flowers remind one strongly of those of some species of *Oxalis*.

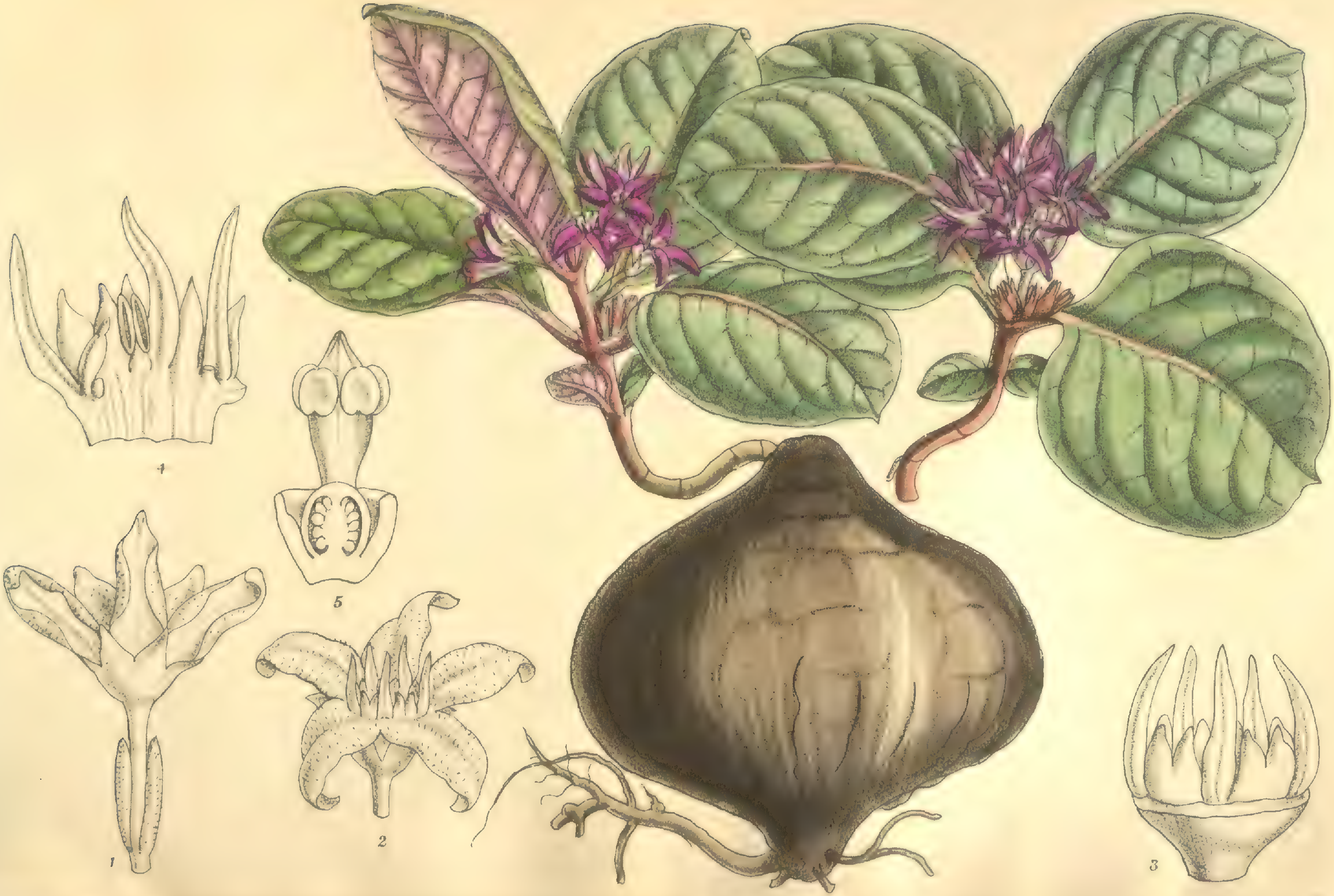
DESCRIPTION.—*Perennial*, stemless, with a thickened root-stock. *Leaves* fleshy, rosulate, oblong-spathulate, 1½–2½ in. long, glandular on the margin when young.

OCTOBER, 1908.

Flower-scapes 4 to 5 in. high, 8–12-flowered, bracteate throughout. *Bracts* about a third of an inch long, glandular on the margin. *Pedicels* curved downwards before the flowers expand. *Flowers* about 1¼ in. in diameter, white with crowded red lines. *Sepals* 2, broad, fringed with stalked glands, overlapping in bud. *Petals* variable in number, usually 9 or 10, spathulate, notched. *Stamens* 7 to 10, shorter than the petals. *Ovary* 1-celled; ovules few; style equalling the stamens.—W. Botting Hemsley.

Cultivation.—*Lewisia Cotyledon* was presented to Kew in 1906 by Mr. P. B. Randulph, Seattle, Washington; the plant came from the Siskiyou Mountains, Oregon. It grew well and flowered freely in May after being potted in sandy soil and placed in an unheated frame. Possibly it will prove hardy in a sheltered position in the rockery. So far it has failed to produce seeds, but it has developed basal offsets which when removed soon grew into plants.—W. Watson.

Fig. 1, pedicel bearing bracts and flower-bud; 2, stamens and pistil; 3 and anthers; 5, pistil; 6, longitudinal section of ovary:—*all enlarged.*



8221.

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TAB. 8221.

RAPHIONACME UTILIS.

Angola.

ASCLEPIADACEAE. Tribe PERIPLOCEAE.

RAPHIONACME, *Harv.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 745.

Raphionacme utilis, *Brown et Stapf in Kew Bulletin*, 1908, p. 215 cum tab.; affinis *R. Welwitschii*, Schlecht. et Rendle, sed planta humilior, foliis latioribus oppositis vel subrosulatis rotundatis ellipticis vel oblongo-ovatis et corona biseriata.

Herba nana, tuberosa. *Tuber* napiformis, 5–14 cm. diametro. *Caules* annui, 2–10 cm. longi, erecti vel decumbentes, herbacei, puberuli. *Folia* opposita vel subrosulata, 3·5–8·5 cm. longa, 3·2–4·5 cm. lata, orbiculata, elliptica vel oblongo-ovata, obtusa, apiculata vel subacuta, basi cuneata, rotundata vel subcordata, petiolis 4–8 mm. longis. *Cymae* terminales vel axillares, sessiles, confertae, pluriflorae, puberulae. *Bracteae* 2–4 mm. longae. *Pedicelli* 3–6 mm. longi. *Sepala* 2 mm. longa, lanceolata, acuta, purpurascentia, apice viridia. *Corolla* 12–15 mm. diametro, profunde 5-loba, extra minutissime puberula, intus glabra, purpurea, lobis oblongis subacutis. *Corona* biseriata, segmentis exterioribus 1 5 mm. longis ovato-oblongis bifidis albis apice purpureis, segmentis interioribus 3 mm. longis subulatis incurvo-erectis purpureis.

This interesting little plant is likely to prove of considerable economic importance, since its tubers yield a large quantity of Rubber said to be of good quality. It has been identified by Dr. Stapf with the "Ecanda" or "Marianga" Rubber-plant, first recorded by Professor Geraldes in his "Estudo sobre os latex borrachiferos," pp. 143–172, published at Lisbon in 1906, and a full account of it is given in the *Kew Bulletin* above quoted, from which, according to Professor Geraldes, the plant is a native of the interior of Angola, growing in the drier parts of treeless, sandy and alluvial areas between the River Kwanza and the River Zambesi, at an altitude of from 4000 to 5500 ft. above sea-level.

It is seldom that a species of *Raphionacme* is seen in cultivation in Europe, this being the first to be figured in the Botanical Magazine, although no fewer than 25 species have been described, nine of them natives of South Africa, the remainder Tropical African. *R. divaricata*, Harv., one of the South African species, sometimes produces tubers 15 in. in diameter and has a very wide range in that region.

DESCRIPTION.—*Herb*, perennial, with a turnip-shaped tuber 2–5 in. in diameter, clothed with a dark brown flaky bark. *Stems* annual, 1–4 in. long, erect or decumbent, puberulous. *Leaves* in 2–5 pairs, opposite or forming a small rosette close to the ground; petiole $\frac{1}{6}$–$\frac{1}{3}$ in. long, blade $1\frac{1}{4}$–$3\frac{1}{3}$ in. long, $1\frac{1}{6}$–$1\frac{3}{4}$ in. broad, orbicular, elliptic or oblong-ovate, obtuse and apiculate or subacute at the apex, cuneate or rounded to subcordate at the base, thinly and minutely puberulous on both sides, green above, purple beneath. *Flowers* in small terminal and axillary cymes or clusters, puberulous except on the inside of the corolla. *Bracts* about $\frac{1}{6}$ in. long, subulate. *Pedicels* $\frac{1}{8}$–$\frac{1}{4}$ in. long. *Sepals* $\frac{1}{8}$ in. long, lanceolate, acute, purplish, with green tips. *Corolla* about $\frac{1}{2}$ in. in diameter, deeply 5-lobed, bright purple, minutely puberulous on the back, glabrous on the inner surface; lobes oblong, subacute, with recurved margins. *Corona* biseriate; outer segments $\frac{1}{16}$ in. long, ovate-oblong, bifid, white, with purple-tipped teeth; inner segments $\frac{1}{8}$ in. long, subulate, incurved-erect, dark purple. *Follicles* (according to Geraldes) as much as 4 in. long, spindle-shaped, acuminate. *Seeds* about $\frac{1}{6}$ in. long, with a tuft of hairs $\frac{2}{3}$ in. long.—N. E. BROWN.

CULTIVATION.—*Raphionacme utilis* was presented to Kew in 1907 by the Companhia de Moçambique, who forwarded tubers of it, stating that "Bitinga" rubber was extracted from them. They were at once planted in soil and placed under tropical conditions where they quickly started into growth and flowered in March this year. The tubers do not shrivel or suffer when kept dry, and they root and grow readily when placed in heat and moisture. Particulars as to the field culture of this plant are given in the *Kew Bulletin* for 1908, p. 214.—W. WATSON.

Figs. 1 and 2, flowers; 3, a flower from which the calyx and corolla have been removed, showing the corona; 4, part of the corona spread out, with two stamens; 5, longitudinal section of the ovary, with style and glands of the pollen-carriers:—*all enlarged.*

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CONTENTS OF No. 46, OCTOBER, 1908.

TAB. 8217.—ECHINOPS TOURNEFORTII.
„ 8218.—ROSA SERICEA, VAR. PTERACANTHA.
„ 8219.—ANISOTES DIVERSIFOLIUS.
„ 8220.—LEWISIA COTYLEDON.
„ 8221.—RAPHIONACME UTILIS.

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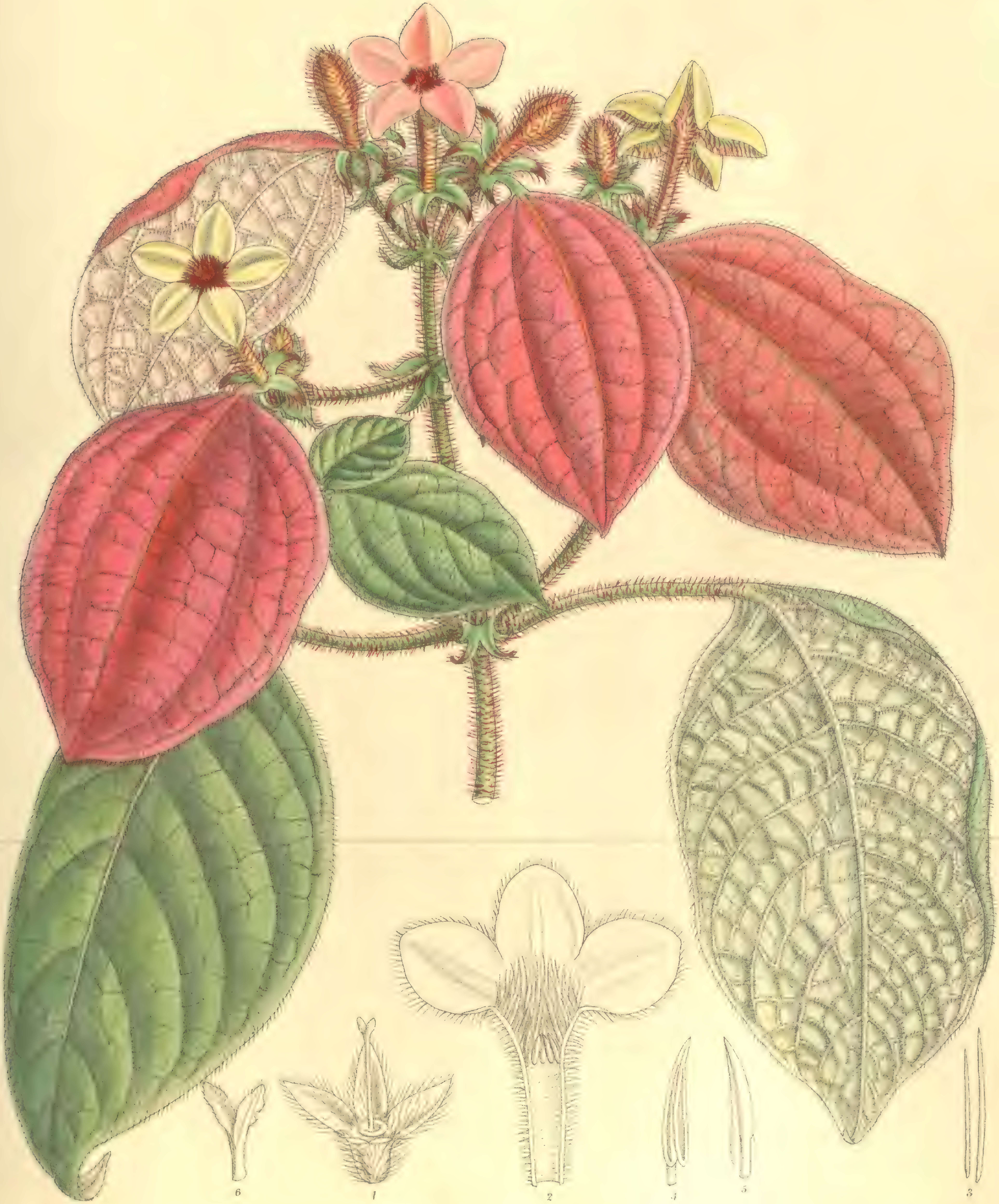

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TAB. 8222.

MUSSAENDA ERYTHROPHYLLA.

Tropical Africa.

RUBIACEAE. Tribe MUSSAENDEAE.

MUSSAENDA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 64.

Mussaenda erythrophylla, *Schum. et Thonn. Pl. Guin.* p. 116; *Hiern in Oliv. Fl. Trop. Afr.* vol. iii. p. 69; species prae folio calycino producto maximo puniceo insignis.

Frutex alte scandens vel vagans vel in campo aperto suberectus, fere undique plus minusve molliter pubescens vel villosus, ramis floriferis tenuiusculis teretibus saepe pilis rubris vestitis. *Folia* ambitu valde variabilia, petiolata, membranacea vel papyracea, ovata vel elliptica, rarius lanceolata vel paene orbicularia, cum petiolo usque ad 18 cm. longa, sed saepius minora, basi nunc rotundata nunc cordata, rarius cuneata vel longe attenuata, apice acuta, attenuate vel abrupte acuminata, margine integro ciliato, in utraque pagina pubescentia, venis primariis lateralibus conspicuis interdum rubris; stipulae bifidae vel trifidae, circiter 1 cm. longae. *Flores* absque folio calycino circiter 3 cm. diametro, in cymas parvas dichotomas densas terminales dispositi, alii sessiles alii breviter pedicellati, extra pilis longis patentibus puniceis dense vestiti, intus flavi, demum rubescentes. *Calycis tubus* florum centralium saepius sterilium breviter obovoideus, limbi lobis omnibus inter se aequalibus; is florum exteriorum plerumque fertilium oblongo-cylindricus, limbi lobis nunc omnibus aequalibus lanceolatis acutis 1–1·5 cm. longis, nunc, plerumque unius floris in quaque cyma, quatuor aequalibus lanceolatis, quinto in folium amplum coccineum vel puniceum jam ante anthesin producto; hoc folium calycinum, ut folia propria, ambitu variabile, interdum usque ad 12 cm. longum et 10 cm. latum, nervis 5–7 percursum, inconspicue parce puberulum. *Corolla* hypocrateriformis; tubus cylindricus, sursum modice dilatatus; limbi lobi ovati, 1–1·5 cm. longi, obtusi, patentes, fauce pilis longis atropurpureis dense barbata. *Stamina* 5, fauci corollae adnata, filamentis brevissimis; antherae inclusae, acutae. *Discus* annularis. *Ovarium* 2-loculare, loculis multiovulatis; stylus glaber, bifidus, inclusus. —*M. splendida,* Welw. in Trans. Linn. Soc. 1869, vol. xxvii. p. 36, t. 13.

This showy shrub was first described as long ago as 1827, from specimens collected by Thonning on the Gold Coast, but the oldest herbarium specimens at Kew were collected by Mr. Gustav Mann in February, 1862, in the Cameroons, at an elevation between 3,000 and 4,500 ft. It has since been collected by numerous travellers in various localities, from Sierra Leone to Angola and eastward to Uganda,

forming one of the most striking objects on the outskirts of forests. Most of the wild specimens are of more compact habit than the plant figured, and have smaller leaves on quite short stalks, and the larger calyx-leaves are even more brilliantly coloured, due doubtless to greater light.

Mussaenda comprises about fifty species which inhabit tropical Asia, Africa and Polynesia, but few of them are in cultivation. The best known is *M. frondosa*, L., figured in the Magazine (t. 2099), from a weakly plant, under the name of *M. pubescens*. The only other one figured in this publication is *M. luteola*, Del. (t. 5573), a very pretty species from the upper Nile region.

Not all of the species of *Mussaenda* have a leaf-like, coloured calyx-lobe, and usually only one flower in each partial cyme of an inflorescence possesses this appendage; but this characteristic is shared by several other genera belonging to different tribes of the Rubiaceae. They are: *Calycophyllum*, *Monadelphantha*, *Capirona*, *Schizocalyx*, *Pinkneya*, *Pogonopus* (*Howardia caracasana*, Wedd., B. M. t. 5110), *Pallasia* and *Warscewiczia*; all American.

Description.—*Shrub*, either suberect or climbing on trees to a height of forty feet or more. *Branches*, leaves and flowers more or less clothed with soft hairs. *Leaves* thin, very variable in outline, from lanceolate to nearly orbicular and with the stalk sometimes as much as 6 or 7 in. long, but usually smaller, rounded, cordate or wedge-shaped at the base, gradually tapering or abruptly acuminate at the tip, margin entire, minutely fringed, both surfaces slightly hairy; primary veins conspicuous, often coloured red; stipules bifid or trifid, about $\frac{1}{3}$ in. long. *Flowers* about $1\frac{1}{4}$ in. across, in dense terminal cymes, some sessile, others shortly stalked, clothed with long spreading crimson hairs on the outside, yellow within changing to red, crimson in the centre. *Calyx-lobes* 5, all lanceolate, $\frac{1}{3}$–$\frac{1}{2}$ in. long, acute, or one leaf-like oval (variable in wild specimens), sometimes as much as 5 in. long by 4 in. broad, brilliant crimson, longitudinally 5- or 7-nerved, slightly hairy. *Corolla* salver-shaped, bearded in the throat. *Stamens* 5, included. *Ovary* 2-celled; cells many-seeded; style included.—W. Botting Hemsley.

Cultivation.—Kew is indebted to Mr. H. N. Ridley, Director of the Singapore Botanic Gardens, for this handsome plant, which he forwarded in a Wardian case in 1907. It was first introduced into cultivation by Mr. Gustav Mann in 1863; at any rate, there is a note written by him on a sheet in the Kew Herbarium to the effect that living plants brought by him from West Africa were in the Garden at that time. But it does not appear to have become established then. Nor was it successfully grown in England when the late Mr. W. Bull distributed it twenty years later. It was included in his Catalogue of New Plants in 1888, p. 8, where it was described as "a remarkable introduction from the Congo." Mr. W. Micholitz, collector for Messrs. Sander & Sons, of St. Albans and Bruges, writes:—"I found *Mussaenda erythrophylla* on the banks of the Kwilu, Loango, French Congo, in 1886, it being then new. The plants that I brought to England in May or June of that year were handed over to Mr. W. Bull, the Chelsea nurseryman, who distributed them as *M. erythrophylla*, but I am not aware that any of them flowered. It is usually of a somewhat creeping or trailing habit, and only attains the shrubby character of *M. frondosa* when growing in the open with full exposure to the sun. As I found it, growing in partial shade in tall virgin forest on the water's edge, it reached the tops of the trees, and, forming as it did long stretches of a high, solid wall of dazzling scarlet, was a sight not easily to be forgotten." At Kew the plants received from Singapore have been grown in a moist tropical stove, where they have formed shapely, well-furnished shrubs about 2 ft. high, and were in flower for about two months. This *Mussaenda* is likely to become a popular garden plant, the red calyx-leaves being quite as effective as the bracts of *Poinsettia*, and they appear to be quite as persistent.—W. Watson.

Fig. 1, part of calyx, disk and style; 2, section of corolla; 3, hairs from the throat of the corolla; 4 and 5, anthers; 6, upper part of style:—*all enlarged.*

M. S. del. J. N. Fitch lith.

Vincent Brooks, Day & Son Lt^d imp.

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TAB. 8223.

MECONOPSIS SINUATA, var. LATIFOLIA.

Himalaya.

PAPAVERACEAE. Tribe EUPAPAVEREAE.

MECONOPSIS, *Vig.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 52; *Prantl & Kündig in Engl. & Prantl Pflanzenfam.* vol. iii. 2, p. 141.

Meconopsis (§ Eumeconopsis) **sinuata,** *Prain in Journ. As. Soc. Beng.* vol. lxiv. 2, p. 314; *Ann. Roy. Bot. Gard. Calcutta,* vol. ix. 1, p. 5, t. 6; *Ann. Bot.* vol. xx. p. 347; species a *M. aculeata,* Royle, foliis minus lobatis capsulaque obconica recedens; var. **latifolia,** *Prain*; a forma typica foliis latioribus capsulaque breviore differt.

Herba ut videtur monocarpica; caulis simplex, scapiformis, 0·35–1·2 m. altus, sparse aculeatus. *Folia* radicalia evanida; caulina alterna, utrinque parce aculeis simplicibus induta, lineari-oblonga vel lanceolata, vel (var. *latifolia*) oblonga, apice obtusa, basi cuneata, margine irregulariter lobata sinuatave, lobis integris, supra viridia, subtus glaucescentia; lamina 10–18 cm. longa, 2–3 cm. vel (var. *latifolia*) 3–5 cm. lata; petioli inferiores 4–6 cm. longi, gradatim breviores, summi bracteis proximi subobsoleti. *Flores* in cymas racemiformes dispositi; pedicelli 2–6 cm. longi, aculeati, fere omnes bracteati; bracteae foliis conformes sed minores sessilesque. *Sepala* 2, ovata, 1·5 cm. longa, extra parce aculeata. *Petala* 4, coerulea, ovato-rotundata, saepe subcuspidata, 3 cm. longa, 2·75 cm. lata. *Stamina* indefinita, pluriseriata; filamenta glabra, discreta, intense coerulea; antherae oblongae, luteae. *Ovarium* e carpellis 4 compositum, ovoideum, 5–7 mm. longum, densius aculeatum; stylus glaber, 3 mm. longus; stigma coloratum, saepius puniceum, nonnunquam aurantiacum. *Capsula* obconica, 3–3·5 cm., vel (var. *latifolia*) 2·5–2·75 cm. tantum longa.

Meconopsis sinuata, not known in gardens, and rare in Alpine Sikkim and Bhutan at 10–12,000 ft., is closely allied to *M. aculeata,* Royle (B. M. t. 5456), the North-west Himalayan prickly "Blue Poppy," but has narrower, slightly-lobed leaves and longer capsules, widest above the middle. The plant here figured, whose introduction we owe to Lt.-Col. H. Appleton, is rare in Northern Kashmir at 10–14,000 ft., where it had previously only been met with by Falconer in 1838, by Winterbottom in 1847, and by Clarke in 1876. Its leaves are as wide as in *M. aculeata,* but as slightly lobed as in *M. sinuata;* its flowers differ from those of *M. aculeata* in having a narrower, more prickly ovary, and a deep pink or bright orange instead of a pale green stigma; its capsules are, though shorter, obconic as in *M. sinuata*, not widest below the middle as in *M. aculeata*. It may prove distinct, but, till it can be compared with living plants of *M. sinuata*, is best treated as a variety, *latifolia*, of that species, with wider leaves and shorter fruits. Clarke met with *M. aculeata* as well as this plant in Kashmir, and in the field has noted that they differ.

DESCRIPTION.—*Herb*, apparently monocarpic; root stout, fusiform; stem simple, scapose, 1–4 ft. high; sparsely covered, like all parts of the plant except the petals, stamens and style, with spreading prickles. *Leaves* many; radical soon disappearing; cauline alternate, linear-oblong or lanceolate, or (var. *latifolia*) oblong, with obtuse tips, irregularly shallowly lobed or sinuate margins, and bases gradually tapering into the petioles, green above, somewhat glaucous beneath, 4–7 in. long, $\frac{3}{4}$–1$\frac{1}{4}$ in., or (var. *latifolia*) 1$\frac{1}{4}$–2 in. wide; lower petioles 1$\frac{1}{2}$–2$\frac{1}{2}$ in. long, gradually shorter upwards and suppressed as the leaves pass into bracts. *Flowers* in raceme-like cymes; pedicels $\frac{3}{4}$–2$\frac{1}{2}$ in. long, bracteate except the uppermost; bracts leaf-like, sessile. *Sepals* 2, ovate, $\frac{1}{2}$ in. long. *Petals* 4, blue, wide-ovate, often slightly cuspidate, 1$\frac{1}{2}$ in. long, 1$\frac{1}{4}$ in. wide. *Stamens* numerous, several-seriate; filaments slender, distinct, deep blue; anthers yellow or pale orange. *Ovary* 4–carpelled, rather closely prickly, ovoid; style glabrous; stigma usually deep-pink, less often bright orange. *Capsule* obconic, sparingly prickly, 1$\frac{1}{3}$–1$\frac{1}{2}$ in., or (var. *latifolia*) 1–1$\frac{1}{4}$ in. long.

CULTIVATION.—Seeds of *Meconopsis sinuata*, var. *latifolia*, were sent to Kew from Kashmir by Lt.-Col. Appleton in February, 1906; the plants flowered in June, 1908. The treatment suitable for *M. aculeata*, which succeeds best in most shady places, planted in a peaty soil, should be adopted for this plant also, which loses its crown of leaves during winter.—D. PRAIN.

Fig. 1, anther; 2, pistil; 3, young fruit:—*figs.* 1 *and* 2 *enlarged.*

8224

M.S. del. J.N.Fitch lith.

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TAB. 8224.

BERBERIS YUNNANENSIS.

China.

BERBERIDACEAE. Tribe BERBEREAE.

BERBERIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 43; *Schneider in Bull. Herb. Boiss.* ser. 2, vol. v. p. 33.

Berberis yunnanensis, *Franch. in Bull. Soc. Bot. France,* vol. xxxiii. 1886, p. 388; *Schneider, Laubholzk.* vol. i. 1904, p. 306; affinis *B. macrosepalae,* Hook. f., a qua ramulis glabris, petalis acutioribus, glandulis minoribus differt.

Frutex 1–2 m. altus, ramis angulato-striatis cinereis. *Folia* obovato-cuneata, apice rotundata, mucronata, 2–4 cm. longa, 0·8–1·5 cm. lata, integra vel spinuloso-serrata, spinulis 1 mm. longis; venae laxae, utrinque conspicuae; spinae 3- vel 5-partitae, 1–2 cm. longae, patentes. *Flores* solitarii vel fasciculati, circiter 2 cm. diametro, perulis ovatis; pedicelli graciles, 1·5–2 cm. longi. *Sepala* 6 vel 7, subaequalia, ovata vel elliptica, 6–8 mm. longa, 4–5 mm. lata. *Petala* late obovata, subacuta, leviter emarginata, 5–6 mm. longa, 3–4 mm. lata, pallide flava, glandulis 2 ellipticis 0·75 mm. longis intus basi instructa. *Stamina* quam petala duplo breviora. *Stigma* subsessile, capitatum. *Bacca* rubra, ellipsoidea, 10–15 mm. longa, 7–8 mm. diametro.

Though very closely allied to *Berberis macrosepala,* Hook. f., *B. yunnanensis* is nevertheless distinguishable by more characters than are indicated by Schneider in the places cited above. He states that the only difference he could find between the two species was that the young branches of *B. yunnanensis* were glabrous and those of *B. macrosepala* shortly pubescent. In *B. yunnanensis,* however, the petals are acute and scarcely emarginate, and bear small rounded glands; whereas in *B. macrosepala* they are obtuse with a broad, widely emarginate apex, and the glands are larger and more elongated.

B. yunnanensis was first discovered by Delavay in 1885 near Lankong, Yunnan, at an altitude of 10,000 ft. Since then it has been collected in Western China by Wilson, who also gathered *B. macrosepala* in the same region; thus greatly extending the known range of that species, which was known only from the Sikkim Himalaya.

NOVEMBER, 1908.

Description.—*Shrub*, 3–6 ft. high; branches angular-striate, greyish. *Leaves* obovate-cuneate, rounded at the apex, mucronate, $\frac{3}{4}$–$1\frac{1}{2}$ in. long, $\frac{1}{3}$–$\frac{2}{3}$ in. broad, entire or spinose-serrate; veins few, conspicuous on both surfaces; spines three- or five-partite, $\frac{2}{5}$–$\frac{3}{4}$ in. long, spreading; scales of the winter-buds ovate. *Flowers* solitary or in few-flowered fascicles, $\frac{3}{4}$ in. in diameter; pedicels slender, $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Sepals* 6 or 7, subequal, ovate or elliptic, about $\frac{1}{3}$ in. long. *Petals* broadly ovate, subacute, very slightly emarginate, $\frac{1}{4}$ in. long, pale yellow; glands of the petals elliptic. *Stamens* half the length of the petals. *Stigma* subsessile, capitate. *Berry* red, ellipsoid, $\frac{1}{3}$–$\frac{1}{2}$ in. long, about $\frac{1}{4}$ in. wide.—J. Hutchinson.

Cultivation.—*Berberis yunnanensis* is one of the new Barberries introduced to cultivation by Mr. Maurice L. de Vilmorin, and it is to him that Kew is indebted for the plant from which the plate was prepared. It was received in February, 1907. It is a bush of dense rounded habit, at present 2 to 3 ft. high. The flowers are large as compared with those of other cultivated Barberries, as is also the fruit. The species is a welcome addition to a beautiful group of hardy shrubs. Barberries are not fastidious as to soil; in the sandy soil of Kew they thrive better than most shrubs, and they produce seeds sufficiently plentifully to afford a simple means of increase.—W. J. Bean.

Fig. 1, stamen and petal, showing the two glands near the base of the latter 2, stamen with the anther-valves still closed; 3, pistil:—*all enlarged.*

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TAB. 8225.

COLUMNEA MAGNIFICA.

Central America.

GESNERIACEAE. Tribe COLUMNEAE.

COLUMNEA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1009; *Fritsch in Engl. & Prantl, Pflanzenfam.* vol. iv. 3 b, p. 169.

Columnea magnifica, *Klotzsch et Hanst. ex Oerst. in Vidensk. Selsk. Skr.* ser. 5, vol. v. 1861, p. 134; *Hanst. in Linnaea*, vol. xxxiv. p. 401; *Sprague in Gard. Chron.* vol. xliii. 1908, p. 66; affinis *C. rotundifoliae*, Salisb., a qua foliis oblongis vel oblanceolatis discique glandula emarginata recedit.

Herba erecta, circiter 30 cm. alta, hirsuto-villosa. *Folia* oblonga usque oblanceolata, acuta, 3–6 cm. longa, 1–2 cm. lata, obscure serrulata, supra asperule appresseque hirsuta, subtus praecipue in venis hirsuta; petioli vix 1 cm. longi. *Flores* in parte superiore caulis axillares, solitarii vel bini, pedicellis circiter 1·5 cm. longis. *Calyx* basi dense villosus; segmenta lanceolata, pectinato-serrata, circiter 1·5 cm. longa. *Corolla* flammea, circiter 6 cm. longa; tubus circiter 3 cm. longus; limbus valde inaequaliter bilabiatus; lobi 4, laterales ultra medium cum postico integro connati; anticus lineari-lanceolatus, 2–2·5 cm. longus, tandem deflexus. Antherae connatae. *Disci glandula* unica, postica, emarginata. *Ovarium* villosum.

Columnea magnifica was discovered about sixty years ago by the orchid collector, Warscewicz, in the province of Veraguas, Panama, and does not seem to have been collected again until 1906, when it was discovered in the mountains of Costa Rica by Carlos Wercklé, at an altitude of between 6,000 and 7,000 ft.

Although placed by Hanstein in the section *Pentadenia*, its real affinities seem to be with *C. scandens*, Linn., and *C. rotundifolia*, Salisb., which are placed in the section *Eucolumnea*.

The headquarters of the genus are in Central America, where it attains its maximum development in Costa Rica. Numerous species are endemic in the South American Andes, and a few in the West Indies.

DESCRIPTION.—*Herb*, erect, about 1 ft. high, villous-hirsute. *Leaves* oblong to oblanceolate, acute, 1–2½ in. long, $\frac{1}{3}$–$\frac{3}{4}$ in. broad, obscurely serrulate, roughish with scattered appressed hairs on the upper surface, veins hirsute on the lower; petioles under $\frac{1}{2}$ in. long. *Flowers* axillary, solitary or two together, borne on the upper part of the stem; pedicels $\frac{1}{2}$–$\frac{3}{4}$ in. long. *Calyx* densely villous at the base; segments lanceolate, pectinate-serrate, over $\frac{1}{2}$ in. long. *Corolla* flame-coloured, about $2\frac{1}{2}$ in. long; tube about $1\frac{1}{4}$ in. long; limb very unequally two-lipped; lobes 4, upper orbicular-oblong much exceeding the others, lateral adnate to upper for more than half their length; lower linear-lanceolate, $\frac{3}{4}$–1 in. long, finally deflexed. *Anthers* connate. *Disk* represented by a single large posticous emarginate gland. *Ovary* villous.—T. A. SPRAGUE.

CULTIVATION.—This plant was introduced into cultivation by Messrs. V. Lemoine & Sons, Nancy, about 4 years ago. It first flowered at Kew in 1906. The figure here given has been prepared from specimens presented by Col. Beddome and by Mr. W. E. Gumbleton. Like the other species of *Columnea* in cultivation this grows and flowers freely in a warm house under conditions such as suit Gesneraceae generally. Compared with *C. scandens* (B. M. t. 5118) and *C. Schiedeana* (B. M. t. 4045) it is not a robust grower, but it is likely to prove useful for pot culture.—W. WATSON.

Fig. 1, part of calyx, gland and pistil; 2, base of corolla laid open and stamens; 3, a jointed glandular hair from the corolla:—*all enlarged.*

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TAB. 8226.

PYRUS SINENSIS.

Manchuria and Korea.

ROSACEAE. Tribe POMEAE.

PYRUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 626; *Focke in Engl. & Prantl, Nat. Pflanzenfam.* vol. iii. part 3, p. 22 (*Pirus*).

Pyrus sinensis, *Lindl. in Trans. Hort. Soc. Lond.* vol. vi. (1826), p. 396; *Bot. Reg. t.* 1248; *C. Schneider, Handb. Laubholzk.* vol. i. p. 663; *P. communi*, Linn., accedens, sed foliis fere sempervirentibus setoso-serratis distincta.

Arbor 10 m. vel ultra alta, ramis novellis glabris vel fugaciter pilosulis saturate brunneis vel purpurascentibus demum nigro-fuscis; gemmae glabrae, ovoideae, perulis acutis. *Folia* ovata, plerumque e basi lata acuminata, dense setoso-serrata, 5–9 cm. longa, 3–6 cm. lata, subcoriacea, diu persistentia, novella ochraceo-araneoso-lanata, mox glabrata; petioli 2–6 cm. longi; stipulae subulatae, ciliatae. *Flores* in brachycladiis foliatis 4–9 in corymbos dispositi; pedicelli glabri vel magis minusve lanati, ad 4 cm. longi. *Calyx* extus uti receptaculum glaber vel lanato-pilosus, intus semper lanatus; sepala lanceolato-triangularia, denticulata, acuta. *Petala* alba, obovata vel ovata. *Antherae* purpureae. *Fructus* in planta silvestri globosus, calyce subpersistente diu coronatus, olivaceus, crebre lenticellatus, 2·5 cm. diametro, sapore adstringente, in planta culta major, interdum obovoideus, sapore grato.—*P. communis*, Thunb. Fl. Japon. 207, non L. *P. chinensis*, Roxb. Hort. Beng. (1814), p. 38 (nomen tantum); Fl. Ind., ed. Carey (1832), vol. ii. p. 511. *P. ussuriensis*, Maxim. ex Maack in Bull. Acad. Petersb. vol. xv. (1857), no. 22, p. 132, et Prim. Fl. Amur. p. 102, *P. Simonii*, Carr. in Rev. Hort. 1872, p. 28, fig. 3; *P. Sieboldii*, Carr. l.c. 1880, p. 110, cum tab. col.

This pear has been in cultivation in Northern China and Japan for a considerable time, and according to Siebold several varieties have been raised from it in Japan. It was introduced into this country by Captain J. P. Wilson in 1820. A fruit produced from a graft in 1823 was described by Lindley as measuring nearly 3 in. in length and 2½ in. in diameter, forming almost a perfect oval, covered with a pale dull yellow skin with numerous rough brown spots, and possessing a white crisp flesh with the flavour of an apple rather than of a pear, and of no particular excellence. A very savoury and aromatic variety was sent by Mr. Simon to the Jardin des Plantes at Paris in 1861. It was described as *P. Simonii* by Carrière. Dr. Bretschneider remarks that Simon's pear is very likely the pai-li (white pear) of the

NOVEMBER, 1908.

Chinese, which is much cultivated in the Province of Chili for its delicious, pale yellow, apple-shaped fruit. Otherwise *P. sinensis* is known in China as sha-li (sand pear) and was mentioned as such by Roxburgh in his Hortus Bengalensis in 1814. According to him it was introduced into the neighbourhood of Calcutta before 1794, but it produced little fruit and that of very bad quality. He figures the pear in an unpublished drawing as much depressed at the top. On the other hand, a very fine coloured Chinese drawing in the Kew collection shows the pear almost globose, of a dull yellowish-brown and with whitish spots. It may be remarked that the basal nerves of the leaves are sometimes much more oblique, more conspicuous, and more produced towards the apex than the others, giving the leaf the appearance of being triplinerved; but, as a rule, the lateral nerves are more or less parallel and uniform. In the wild state the sand pear was found by Maack, Maximowicz, and others in the valleys of the southern tributaries of the lower Amur and the Manchurian littoral. Here the fruit is smaller and very astringent.

DESCRIPTION.—*Tree*, 30–40 ft. high, with glabrous or fugaciously hairy branchlets which at first are of a warm brown or purplish colour, but at length turn dark or greyish-brown. *Leaf buds* glabrous, ovoid, with very acute scales. *Leaves* ovate from a broad base, acuminate, densely serrate, the teeth running out into fine almost bristle-like points which may at length fall off, 2–4 in. long, 1¼ to over 2 in. broad, subcoriaceous, of a rich green when mature, long persistent, glabrous or when young more or less covered with a cobwebby brownish tomentum, particularly along the edges and midrib; petiole 1–2 in. long; stipules subulate, ciliate. *Flowers* in 4–9-flowered corymbs on sparingly leafy short shoots; pedicels glabrous or more or less hairy, sometimes almost 2 in. long. *Calyx* like the receptacle, glabrous or cobwebby, woolly without, always woolly within; sepals ovate-lanceolate or triangular, denticulate. *Petals* white, obovate to ovate, ⅔–¾ in. long. *Anthers* purple. *Fruit* in the wild plant globose with a subpersistent calyx, olive-brown with numerous lenticels, 1 in. in diameter, in the cultivated plant much larger, as much as 3 in. across, and sometimes obovoid.—OTTO STAPF.

CULTIVATION.—This interesting pear has been cultivated at Kew since 1875. In the spring of that year a valuable collection of grafts of *Pyrus* was presented to Kew by the late Prof. Decaisne. It was from one of these that the plant now figured was raised. It flowers freely almost every year early in April, but rarely produces a large crop of fruit. This species thrives very well in the ordinary soil of Kew.—W. J. BEAN.

Fig. 1, a flower from which the petals and stamens have been removed:—*enlarged.*

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CONTENTS OF No. 47, NOVEMBER, 1908.

TAB. 8222.—MUSSAENDA ERYTHROPHYLLA.
,, 8223.—MECONOPSIS SINUATA, VAR. LATIFOLIA.
,, 8224.—BERBERIS YUNNANENSIS.
,, 8225.—COLUMNEA MAGNIFICA.
,, 8226.—PYRUS SINENSIS.

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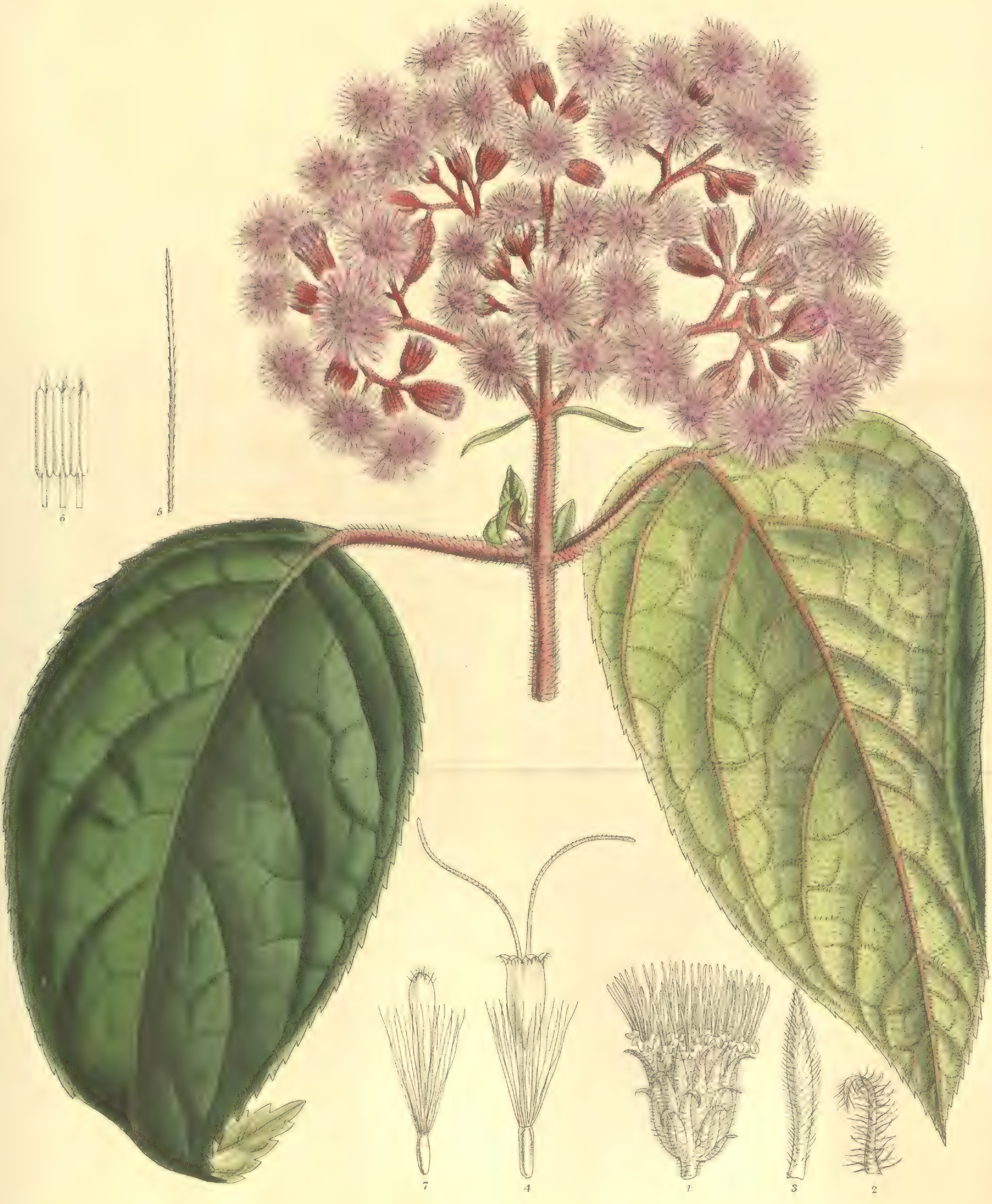

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TAB. 8227.

EUPATORIUM RAFFILLII.

Central America?

COMPOSITAE. Tribe EUPATORIEAE.
EUPATORIUM, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 245.

Eupatorium Raffillii, *Hemsl.*, species ex affinitate *E. ianthini*, Hemsl. (*Hebeclinium ianthinum*, Hook., B. M. t. 4574), a quo inflorescentia araneoso-tomentosa, capitulis majoribus subumbellatis et involucri bracteis paucioribus differt; etiamque *E. sordido*, Less., arcte affinis, a quo foliis cito glabrescentibus et capitulis majoribus subumbellatis recedit.

Frutex 0·5–1 m. altus, ramis rectis teretibus primum rubro-brunneis tomentosis. *Folia* opposita, longe petiolata, crassiuscula, ovata basi rotundata vel inferiora oblanceolata, basi cuneata, absque petiolo 12–15 cm. longa, 7–10 cm. lata, acuta, supra basin quintuplinervia, primum utrinque parce obscureque setulosa, margine minute calloso-denticulata; petioli teretes, 3–8 cm. longi. *Capitula* numerosa, circiter 2 cm. diametro, in cymas compositas terminales erectas subglobosas 10–15 cm. diametro dispositi; pedunculi breves, rigidi, ferrugineo-tomentosi vel lanati, subumbellati. *Involucri bracteae* circiter 40, 3–4-seriatae, tenues, rubro-brunneae, hirsutae, lineares, exteriores breviores, filiformes, omnes acutae, interiores corollis aequales. *Corollae* lilacinae, omnes tubulosae; tubus supra medium inflatus, lobis parvis piliferis. *Stamina* inclusa. *Styli* longissime exserti. *Achaenia* glabra; pappi setae molles, albae, quam corolla tertia parte breviores.—*Hebeclinium ianthinum*, Hort. nonnull., non Hook.

The history of the introduction of this *Eupatorium* into cultivation is not known. Mr. C. P. Raffill, of the tropical department at Kew, who procured a plant of it from the Birmingham Botanic Garden, called attention to it as being different from *E.* (*Hebeclinium*) *ianthinum*, under which name it was there grown. Whether it be really an undescribed species, it is difficult to say. It is certainly very near the two species with which it is compared above, and is also very near a specimen in the Kew Herbarium, collected at Cuernavaca, Morelos, Mexico, by C. G. Pringle, n. 8048, issued as "*E. subtriplinervium*, Kl.," doubtless in error for *E. septuplinervium*, Klatt, published in Leopoldina, 1884, vol. xx. p. 90, where *Hebeclinium sordidum* and *H. macrocephalum*, Schulz-Bip., non Benth., are given as synonyms.

DECEMBER, 1908.

DESCRIPTION.—*Shrub*, 1½–3 ft. high. *Branches* straight, round, clothed with a red-brown felt when young. *Leaves* opposite, on long stalks, rather thick, almost fleshy, base ovate and rounded or sometimes lanceolate and wedge-shaped, 4½ to 6 in. long without the stalk, 2½ to 4 in. broad, acute, 5-nerved above the base, at first sparsely furnished with small bristles, margin minutely toothed; stalks round, 1¼ to 3 in. long. *Flower*-heads numerous, nearly 1 in. across, in terminal, erect, compound clusters, 4 to 6 in. across; stalks umbellately arranged. *Bracts* of the involucre about 40, in 3 or 4 series, thin, hairy, red-brown, linear, outer ones shorter, filiform, all acute, inner ones nearly as long as the corollas. *Flowers* all tubular, lilac. *Stamens* included. *Styles* exserted, very long, filiform, divergent. *Achenes* very small, glabrous; bristles of the pappus soft, white, about a third shorter than the corolla.—W. BOTTING HEMSLEY.

CULTIVATION.—This species has long been cultivated in the Birmingham Botanic Gardens under the erroneous name of *Hebeclinium ianthinum*. It is, however, superior, in a decorative sense, to *E. (H.) ianthinum*, the heads of flowers being fuller and richer in colour, while the leaves also are more handsome. It grows quickly into a shapely specimen 2 ft. or so high and is in full flower in mid-winter. Although it will grow and flower in an ordinary greenhouse this plant is seen at its best under good cultivation in a tropical house. Cuttings rooted in early summer and grown on in pots in a moist stove quickly grow into handsome specimens; they last in flower a month or more.—W. WATSON.

Fig. 1, a flower-head; 2, and 3, bracts of the involucre; 4, a flower; 5, a bristle of the pappus; 6, anthers; 7, an unopened flower:—*all enlarged.*

8228

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TAB. 8228.

CORYTHOLOMA MACROPODUM.

South Brazil.

GESNERIACEAE. Tribe SINNINGIEAE.

CORYTHOLOMA, *Decaisne*; *Fritsch in Engler & Prantl, Pflanzenfam.* vol. iv. 3b, p. 180.—*Gesnera*, Mart.; Benth. et Hook. f. Gen. Plant. vol. ii. p. 1003; nec *Gesneria*, Linn.

Corytholoma macropodum, *Sprague in Kew Bull.* 1908, p. 20; affinis *C. canescenti*, Fritsch, a quo indumento sparsiore necnon glandulis disci omnibus evolutis recedit.

Herba 16–22 cm. alta, e tubere depresso-globoso perennans. *Caules* 1–2, simplices, paria 1 vel 2 foliorum gerentes, ut petioli, pedunculi, pedicelli, calyces extra pilis glanduloso-capitatis et paucis eglandulosis patenter hirsuti. *Folia* suborbicularia, basi cordata, 8–13 cm. diametro, obtuse serrata, ciliata, supra nitidula, pilis erectis glandulosis inspersa, venis impressis, subtus in venis et venulis valde prominentibus hirsuta, ceterum glabra; petioli 1–2 cm. longi. *Cymae* in axillis solitariae, pedunculis 5–10 cm. longis. *Flores* 5–7, pseudo-umbellati, penduli, pedicellis 1–2 cm. longis. *Calyx* intus nitidulus, puberulus; tubus brevissimus; lobi ovati, acuminati, circiter 5 mm. longi. *Corolla* cinnabarina; tubus 2·5–3 cm. longus, fere cylindricus, basi annulatim inflatus; superne leviter ventricosus, extra densiuscule pubescens; lobi patuli, inferiores rubro-guttati vel maculati, superiores concolores. *Disci glandulae* quinque, duae posticae in ephippium connatae, laterales et antica liberae. *Ovarium* densiuscule pubescens, stylo glanduloso-puberulo; placentae bilamellatae.

The genus *Gesneria*, the type of the family *Gesneriaceae*, was founded by Linnaeus on two West Indian species, *G. humilis* and *G. tomentosa*, published in his Species Plantarum, ed. 1, 1753, p. 612. During the succeeding 70 years many additional species were described, and it at length became evident that species belonging to several distinct genera were included under *Gesneria*. Martius (Nov. Gen. et Sp. vol. iii. 1829, p. 27) accordingly distinguished three genera, one of which was based on *G. humilis*, and a second on *G. tomentosa*, whilst the third included the great majority of the described species, namely, those provided with tuberous rootstocks. Instead of retaining the name *Gesneria* for one of the original species, Martius proposed the new generic names *Conradia* and *Rytidophyllum* for *G. humilis* and *G. tomentosa*, respectively, and applied Linnaeus's generic name, modified to *Gesnera*, to the subsequently described species possessing tuberous rootstocks. By common consent among botanists the name *Gesneria* is now retained for *G. humilis* and its allies, and *Rytidophyllum* for *G. tomentosa* and its allies, whilst the name *Corytholoma* is applied to the species with tuberous rootstocks. The latter are, however, still commonly known in gardens under the generic name *Gesnera*, and include the following which have been figured in this magazine:—*G. aggregata*, t. 2725, *Lindleyi*, t. 3602, *Marchii*, t. 3744, *cardinalis*, t. 8167, and many others.

The plant of *Corytholoma macropodum* here figured differed from those originally raised in having a single pair of large leaves instead of two pairs of small leaves, and blotches on the lower lip of the corolla as against small spots in the original plants. Like many other *Gesneriaceae* it appears to be highly plastic and may in time give rise to garden races unlike the wild species.

DESCRIPTION.—*Herb*, 6–9 in. high, glandular-hirsute, tuber subglobose, perennial. *Stems* one or two, annual, unbranched, bearing one or two pairs of leaves. *Leaves* suborbicular, cordate at the base, 3–5 in. in diameter, obtusely serrate, ciliate, upper surface pilose with short erect glandular hairs, lower surface with very prominent hirsute veins, otherwise glabrous; petioles about ½ in. long. *Cymes* solitary, axillary, 5–7-flowered; peduncles 2–4 in. long. *Flowers* subumbellate, pendulous; pedicels ½–¾ in. long. *Calyx-tube* very short; lobes ovate, acuminate. *Corolla* cinnabar-red, pubescent outside; tube 1 in. or more long, nearly cylindric, with an annular swelling at the base and slightly ventricose above; limb two-lipped, the upper lip consisting of two, the lower of three lobes; lobes of lower lip blotched with purple. *Glands* of the disk 5, the two posticous ones united in the form of a horseshoe. *Ovary* rather densely pubescent; style glandular-puberulous; placentas bilamellate.—T. A. SPRAGUE.

CULTIVATION.—*Corytholoma macropodum* was raised from seeds collected in São Paulo, by Mr. G. H. Weigt, Director, Botanical Parks, Piracicaba, Brazil, and forwarded to Kew in 1906 with a recommendation of the plant as a good decorative species. It grew freely under the treatment given to other tropical gesneriads and flowered at Kew in April. There are other Gesnerias with flowers of the same shape, colour and arrangement as *C. macropodum*, but none of those in cultivation have the remarkable bifoliate stems which characterise this species.—W. WATSON.

Fig. 1, calyx and pistil; 2, base of corolla-tube laid open; 3, anthers; 4, ovary; 5, whole plant:—1–4 *enlarged*, 5, *much reduced*.

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TAB. 8229.

ERIA HYACINTHOIDES.

Java.

ORCHIDACEAE. Tribe EPIDENDREAE.

ERIA, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 500.

Eria hyacinthoides, *Lindl. Gen. & Sp. Orch.* p. 66; *Miq. Fl. Ind. Bat.* vol. iii. p. 660; *J. J. Smith, Orch. Jav.* p. 410; affinis *E. bicristatae,* Lindl., sed racemis triplo longioribus et multifloris differt.

Herba epiphytica, circa 30 cm. alta. *Pseudobulbi* erecti, oblongi, subcompressi, 6–7 cm. longi, vaginis brunneis vestiti, 2–3-phylli. *Folia* petiolata, elongata, subobtusa, coriacea, 20–30 cm. longa, 3·5–4·5 cm. lata, basi attenuata. *Pedunculi* axillares, erecti, 10–15 cm. longi; racemi multiflori, rachi et pedicellis albido-tomentosis. *Bracteae* ovatae, acutae, concavae, pubescentes, 4–6 mm. longae. *Pedicelli* 7–10 mm. longi. *Flores* pubescentes, albi; anthera flava. *Sepalum posticum* oblongum, obtusum, circa 1·3 cm. longum; sepala lateralia ovato-oblonga, obtusa, 1·3 cm. longa; mentum oblongum, obtusum, circa 6 mm. longum. *Petala* ovato-oblonga, obtusa, circa 1 cm. longa. *Labellum* trilobum, circa 1 cm. longum; lobi laterales erecti, triangulares, acuti; lobus intermedius reflexus, ovato-oblongus, obtusus; discus prominenter longitudinaliter bicallosus, canaliculatus. *Columna* clavata, 7–8 mm. longa.

Eria hyacinthoides, Lindl., is a Javan species which was originally described by Blume in 1825 under the name of *Dendrolirium hyacinthoides*; the two genera cannot, however, be separated. The species was recorded as a native of Mt. Salak. Lindley probably only knew it from description, for his herbarium contains but a single flower, marked as authentic, which was afterwards sent to him by Reichenbach. The plant here figured was obtained from Leiden by Mr. F. W. Moore, Glasnevin, under the name of *E. bicristata*, Lindl., but that species according to the original description has a short, few-flowered inflorescence, and Mr. J. J. Smith, author of Die Orchideen von Java, considers our plant to be *E. hyacinthoides*, Lindl.; it certainly agrees better with the description of the latter. Smith, however, describes the side lobes of the lip as deep violet brown, a character not mentioned by Blume. He further considers *E. ebulbis*, Lindl. (*Dendrolirium ebulbe*, Blume) and *E. Endymion*, Ridl., as synonymous; this point requires confirmation, for Blume placed the former in a different section from *E. hyacinthoides*, and the latter is a native of

Singapore. Further material is necessary to clear up these points. Several of the Javan species are very imperfectly known, and Smith enumerates eight out of thirty-five as doubtful. *Eria* is a large and difficult genus, bearing a considerable general resemblance to *Dendrobium*, from which it is readily separated by its eight pollinia. The species are not commonly cultivated except in botanical gardens, and as the fleshy crests of the lip shrink greatly in drying they are unusually difficult to discriminate. They are chiefly concentrated in the Indo-Malayan region.

DESCRIPTION.—*Epiphyte*, about a foot high. *Pseudobulbs* erect, oblong, somewhat compressed, $2\frac{1}{2}$–3 in. long, clothed with brown sheaths, 2–3-leaved. *Leaves* petioled, elongate-oblong, subobtuse, coriaceous, 8–12 in. long, about $1\frac{1}{2}$ in. broad, somewhat attenuate at the base. *Peduncles* axillary, erect, stoutish, 4–6 in. long; racemes elongate, many-flowered. *Bracts* ovate, acute, concave, pubescent, about $\frac{1}{4}$ in. long. *Pedicels* about $\frac{1}{3}$ in. long, white-tomentose as is the rachis. *Flowers* pubescent, white, with a yellow anther. *Dorsal sepal* oblong, obtuse, over $\frac{1}{2}$ in. long; lateral ovate-oblong, obtuse, over $\frac{1}{2}$ in. long; mentum oblong, obtuse, about $\frac{1}{4}$ in. long. *Petals* ovate-oblong, obtuse, about $\frac{1}{2}$ in. long. *Lip* 3-lobed, about $\frac{1}{2}$ in. long; side-lobes erect, triangular, acute; front-lobe reflexed, ovate-oblong, obtuse; disk with two prominent fleshy keels, channelled. *Column* clavate, about $\frac{1}{3}$ in. long.—R. A. ROLFE.

CULTIVATION.—*Eria hyacinthoides* was presented to Kew in 1903 by Mr. F. W. Moore, Keeper of the Royal Botanic Gardens, Glasnevin. It is a sturdy grower and produces in May several spikes of white flowers which last a long time. Like the rest of the genus this species enjoys liberal treatment during its growing period, which is from April to September, and a lower temperature with little or no water at the root during its resting period. It thrives in a mixture of peat fibre and sphagnum in a pan or teak basket suspended near the roof glass in the tropical orchid house.—W. WATSON.

Fig. 1, column with lip attached; 2, lip seen from front; 3, anther-cap; 4, pollinia:—*all enlarged*.

8230

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TAB. 8230.

CYTISUS DECUMBENS.

South Europe.

LEGUMINOSAE. Tribe GENISTEAE.
CYTISUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 484.

Cytisus (§ Alburnoides) **decumbens,** *Spach in Ann. Soc. Nat.* 1845, sér. 3, vol. iii. p. 156; *Briq. Les Cystises des Alpes Maritimes*, 1894, p. 159; *C. procumbenti*, Spreng., affinis, sed foliolo utrinque longe piloso, legumine undique longe piloso differt.

Fruticulus decumbens, 10–20 cm. altus, ramis junioribus pentagonis pubescentibus demum glabris. *Folia* unifoliolata; foliolum sessile, oblongo-obovatum, apice rotundatum vel vix subacutum, basi attenuatum, 1–1·5 cm. longum, 0·3–0·5 cm. latum, utrinque longe pilosum, ciliatum, nervis lateralibus indistinctis. *Flores* solitarii vel 2–3-fasciculati; pedicelli usque ad 1 cm. longi. *Calyx* subcampanulatus, 4–5 mm. longus, bilabiatus, labiis quam tubo brevioribus, extus parce pilosus; labium superum bidentatum; inferum breviter acuteque tridentatum. *Vexillum* late obovatum, multinervium, circiter 1 cm. latum, ungue 2 mm. longo. *Alae* oblongae, 1 cm. longae, 0·5 mm. latae, 6–7-nerviae, unguibus 4 mm. longis. *Carina* 1 cm. longa, ungue 4 mm. longo. *Tubus stamineus* glaber, 7 mm. longus. *Antherae* 1–1·5 mm. longae. *Ovarium* villosum, stylo circiter 6 mm. longo, stigmate minuto. *Legumen* 1·5–2 cm. longum, 4–6 mm. latum, undique longe pilosum. *Semina* 3–4, rotundata, 3 mm. diametro, strophiolata, strophiolo rotundato 1 mm. diametro.—*Spartium decumbens*, Durande Fl. de Bourgogne, 1782, vol. i. p. 299. *Genista pedunculata*, L'Hérit. Stirp. Rar. 1784–85, p. 184. *G. prostrata*, Lamk, Encycl. Meth. 1786, vol. ii. p. 618. *G. Halleri*, Reyn. ex DC. Prodr. 1825, vol. ii. p. 152. *Corothamnus Halleri*, Presl. Bot. Bemerk. 1844, p. 137. *C. Kitaibelii*, Vis. Fl. Dalm. 1850, vol. iii. p. 269. *C. decumbens*, var. *Halleri*, Reichb. Ic. Fl. Germ. et Helv. 1869, vol. xxii. p. 8. *C. decumbens*, C. Koch. Dendrologie, 1869, vol. i. p. 44. *Genista Kitaibellii*, Janka in Termész. Füzetek, 1884, vol. viii. 2, p. 60. *Cytisus prostratus*, Simonk. Cyt. Hung. in Termész. Kozlem. 1888, vol. xxii. p. 364, non Scop.—Synonimia omnino secundum cl. Briquet in loco supra citato.

Cytisus decumbens has a very wide range in the South of Europe, extending from France to Albania. It belongs to the sub-section *Corothamnus*, Briq., which is chiefly distinguished by having all the leaves unifoliolate. Two other species besides the one here figured, *C. procumbens*, Spreng., and *C. diffusus*, Vis., possess this character, all the others being trifoliolate. Godron, Fl. de France, 1848, i. p. 360, indicates three varieties, characterized by the length of the pedicels and the size of the flowers.

DECEMBER, 1908.

Description.—*Shrub*, 4–8 in. high, procumbent; young branches 5-angled, pubescent, at length glabrous. *Leaves* unifoliolate; leaflet sessile, oblong-obovate, rounded at the apex or slightly acute, narrowed to the base, $\frac{1}{3}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$–$\frac{1}{6}$ in. broad, pilose on both surfaces, ciliate, lateral nerves indistinct. *Flowers* solitary or two to three together; pedicels $\frac{1}{2}$–$\frac{1}{3}$ in. long. *Calyx* subcampanulate, $\frac{1}{6}$ in. long, two-lipped, lips shorter than the tube, sparingly pilose outside; upper lip bidentate; lower lip shortly tridentate, teeth acute. *Standard* broadly obovate, many-veined, about $\frac{1}{3}$ in. broad, claw $\frac{1}{8}$ in. long. *Wing-petals* oblong, $\frac{1}{3}$ in. long, 6–7-veined, claw $\frac{1}{6}$ in. long. *Keel-petals* $\frac{1}{2}$ in. long. *Staminal-tube* glabrous, $\frac{1}{4}$ in. long. *Ovary* villous; style about $\frac{1}{4}$ in. long, stigma minute. *Pod* $\frac{1}{2}$–$\frac{3}{4}$ in. long, pilose on all sides. *Seeds* 3 or 4, rounded, with a distinct, rounded strophiole.—J. Hutchinson.

Cultivation.—*Cytisus decumbens* is a charming small trailer, the stems keeping close to the ground and forming a cushion not more than 6 in. high, which in May is studded all over with bright yellow flowers. It may be grown in a border so as to form a carpet below other taller shrubs, or in a sunny position in the rock garden. The Kew examples were originally raised from seeds received in 1895 from the Goettingen Botanic Garden.—W. Watson.

Fig. 1, leaflet; 2, calyx with stamens and pistil; 3, calyx laid open with pistil; 4, standard; 5, wing petal; 6, keel-petal; 8, seed:—*all enlarged* 7, fruit:—*natural size.*

8231

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TAB. 8231.

HIBISCUS APONEURUS.

Tropical East Africa.

MALVACEAE. Tribe HIBISCEAE.

HIBISCUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 207; *Hochreutiner in Ann. Conserv. & Jard. Bot. Genève,* vol. iv. 1900, p. 23.

Hibiscus aponeurus, *Sprague et Hutchinson in Kew Bull.* 1908, p. 54; affinis *H. crassinervio*, Hochst., a quo bracteolis lineari-subulatis calyce manifeste brevioribus calycisque venatione recedit.

Planta erecta, fruticans, 0·3–1 m. alta, stricte ramosa, caule inferne denudato, ramis gracilibus dense asperule stellato-pubescentibus. *Folia* ovata vel elliptica, interdum subtrilobata, apice rotundata vel obtusa, basi rotundata, 2·5–4 cm. longa, 2–3 cm. lata, serrulata, utrinque sed subtus densius asperule pubescentia; petioli 1–2 cm. longi. *Stipulae* filiformes, 5–9 mm. longae. *Flores* plantae cultae in axillis solitarii, pedunculis 3 cm. longis circiter 8 mm. infra apices articulatis. *Bracteolae* 9–13, ascendentes, inaequales, lineari-subulatae, 4–6 mm. longae, antrorse hirsutae. *Calyx* extra dense stellato-hirsutus, intus superne minute pubescens, inferne glaber; tubus 3 mm. longus, 15-nervius; lobi e basi triangulari-subulati, vix ultra 5 mm. longi, basi 2 mm. lati, trinervii, superne reflexi. *Corolla* vivide coccinea, 2·5 cm. diametro, extra stellato-pilosa. *Columna staminea* curvata (au semper?), apice 5-dentata, staminum verticillos quatuor alternantes gerens, quorum infimus oppositipetalus, pentandrus, ceteri decandri; filamentella 1–2 mm. longa. *Ovarium* 5-loculare, minute albo-tomentellum, loculis 5–7-ovulatis; stigmata capitata, penicillata. *Capsula* ellipsoidea, vix ultra 1 cm. longa, 8 mm. diametro, nitidula, pubescens.—*H. crassinervius*, T. Thoms. in Speke, Journal, p. 627, non Hochst. *H. gossypinus*, Mast. in Oliv. Fl. Trop. Afr. vol. i. p. 205, partim, non Thunb. *H. gossypinus*, var., Oliv. in Trans. Linn. Soc. vol. xxix. p. 37, t. 14.

Hibiscus aponeurus belongs to the section Bombycella, which is characterized by relatively small flowers and woolly seeds, and includes about forty species, nearly two-thirds of which are natives of Africa. *H. aponeurus* is intermediate, both geographically and in technical characters, between *H. crassinervius*, Hochst., and *H. Hildebrandtii*, Sprague & Hutchinson, and has been found over a wide area in Uganda, British East Africa and German East Africa, occurring at elevations of 4,000–6,000 ft. According to Grant, it grows both in the valleys and on the hills of Karagué.

Comparatively few species of the section seem to have come into cultivation, among them being *H. phoeniceus*,

Jacq., figured in the Botanical Register, vol. iii. t. 230, and *H. hirtus*, L., l.c. iv. t. 337, as *H. Rosa-malabarica.* The former may be distinguished by its long spreading bracteoles, and the latter by the coarsely serrate, acute, relatively glabrous leaves.

Description.—*Plant* erect, shrub-like, 1–4 ft. high; branches slender, strict, harshly stellate-pubescent. *Leaves* ovate or elliptic, sometimes slightly three-lobed, rounded or obtuse at the apex, rounded at the base, 1–$1\frac{1}{2}$ in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. broad, serrulate, harshly pubescent on both surfaces, more densely so below; petioles $\frac{1}{3}$–$\frac{3}{4}$ in. long. *Stipules* filiform, $\frac{1}{5}$–$\frac{1}{3}$ in. long. *Flowers* solitary, axillary; peduncles over 1 in. long, jointed $\frac{1}{3}$ in. below their apex. *Bracteoles* 9–13, sharply ascending, unequal, linear-subulate, $\frac{1}{6}$–$\frac{1}{4}$ in. long, antrorsely hirsute. *Calyx* densely stellate-hirsute outside, minutely pubescent inside in the upper part, glabrous below; tube $\frac{1}{8}$ in. long, 15-nerved; lobes subulate from a triangular base, $\frac{1}{5}$ in. long, $\frac{1}{12}$ in. broad at the base, 3-nerved, reflexed above. *Corolla* brilliant scarlet, 1 in. across, stellate-pilose outside. *Staminal column* curved, 5-toothed at the apex, bearing 4 alternating whorls of stamens, the lowest one consisting of 5 single stamens opposite the petals, the others of 5 pairs each; partial filaments $\frac{1}{12}$ in. long or less. *Ovary* 5-celled, minutely whitish tomentose; cells 5–7-ovuled; stigmas capitate, penicillate. *Capsule* ellipsoidal, $\frac{2}{5}$ in. long, $\frac{1}{3}$ in. across, slightly shining, pubescent.—T. A. Sprague.

Cultivation.—*Hibiscus aponeurus* was raised from seeds collected in British East Africa by Lady Hindlip, who kindly presented cuttings of it to Kew in 1905. It forms a neat little shrub, and in June is gay with numerous bright scarlet flowers. At Kew it has been grown in a warm house, but it would probably be quite at home under ordinary greenhouse treatment. Like the majority of the species of *Hibiscus* it is very easy to cultivate, thriving in ordinary soil.—W. Watson.

Fig. 1, a flower-bud; 2, portion of calyx; 3, staminal column and pistil; 4, partial filaments and anthers:—*all enlarged.*

INDEX

To Vol. IV. of the Fourth Series, or Vol. CXXXIV. of the whole Work.

8214 Agave Watsoni.
8219 Anisotes diversifolius.
8202 Begonia cathayana.
8185 Berberis acuminata.
8224 „ yunnanensis.
8187 Bulbophyllum Binnendijkii.
8199 „ fascinator.
8216 „ galbinum.
8207 Caesalpinia japonica.
8200 Chirita barbata.
8178 Codonopsis convolvulacea.
8203 Coelogyne perakensis.
8225 Columnea magnifica.
8228 Corytholoma macropodum.
8183 Cypripedium debile.
8230 Cytisus decumbens.
8204 Didymocarpus cyanea.
8217 Echinops Tournefortii.
8229 Eria hyacinthoides.
8209 Eucryphia cordifolia.
8227 Eupatorium Raffillii.
8201 Genista glabrescens.
8175 Herbertia amatorum.
8231 Hibiscus aponeurus.
8208 Indigofera hebepetala.
8188 Kaempferia Kirkii, *var.* elatior.
8181 Larix Griffithii.
8220 Lewisia Cotyledon.
8195 Liparis tabularis.
8223 Meconopsis sinuata, *var.* latifolia.
8222 Mussaenda erythrophylla.
8191 Olearia ciliata.
8205 Olearia ramulosa, *var.* communis.
8173 Paeonia Mlokosewitschii.
8197 Pandanus Houlletii.
8193 × Philadelphus purpureo-maculatus.
8172 × Philodendron Corsinianum.
8211 Polystachya Lawrenceana.
8180 Potentilla concolor.
8196 Prunus tomentosa.
8176 Pseudolarix Fortunei.
8194 Puya violacea.
8184 Pyrus Aria, *var.* majestica.
8226 „ sinensis.
8179 „ Tschonoskii.
8221 Raphionacme utilis.
8177 Rehmannia angulata.
8190 Rheum inopinatum.
8210 Rhododendron kamtschaticum.
8212 Rhododendron Maddeni, *var.* obtusifolia.
8206 Rhododendron Mariesii.
8198 „ micranthum.
8213 Robinia Kelseyi.
8218 Rosa sericea, *var.* pteracantha.
8186 Rosa Willmottiae.
8189 Saxifraga Brunoniana.
8182 Sinningia Regina.
8192 Tillandsia Blokii.
8174 Viburnum utile.
8215 Zaluzianskya maritima.

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CONTENTS OF No. 48, DECEMBER, 1908.

TAB. 8227.—EUPATORIUM RAFFILLII.
„ 8228.—CORYTHOLOMA MACROPODUM.
„ 8229.—ERIA HYACINTHOIDES.
„ 8230.—CYTISUS DECUMBENS.
„ 8231.—HIBISCUS APONEURUS.

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